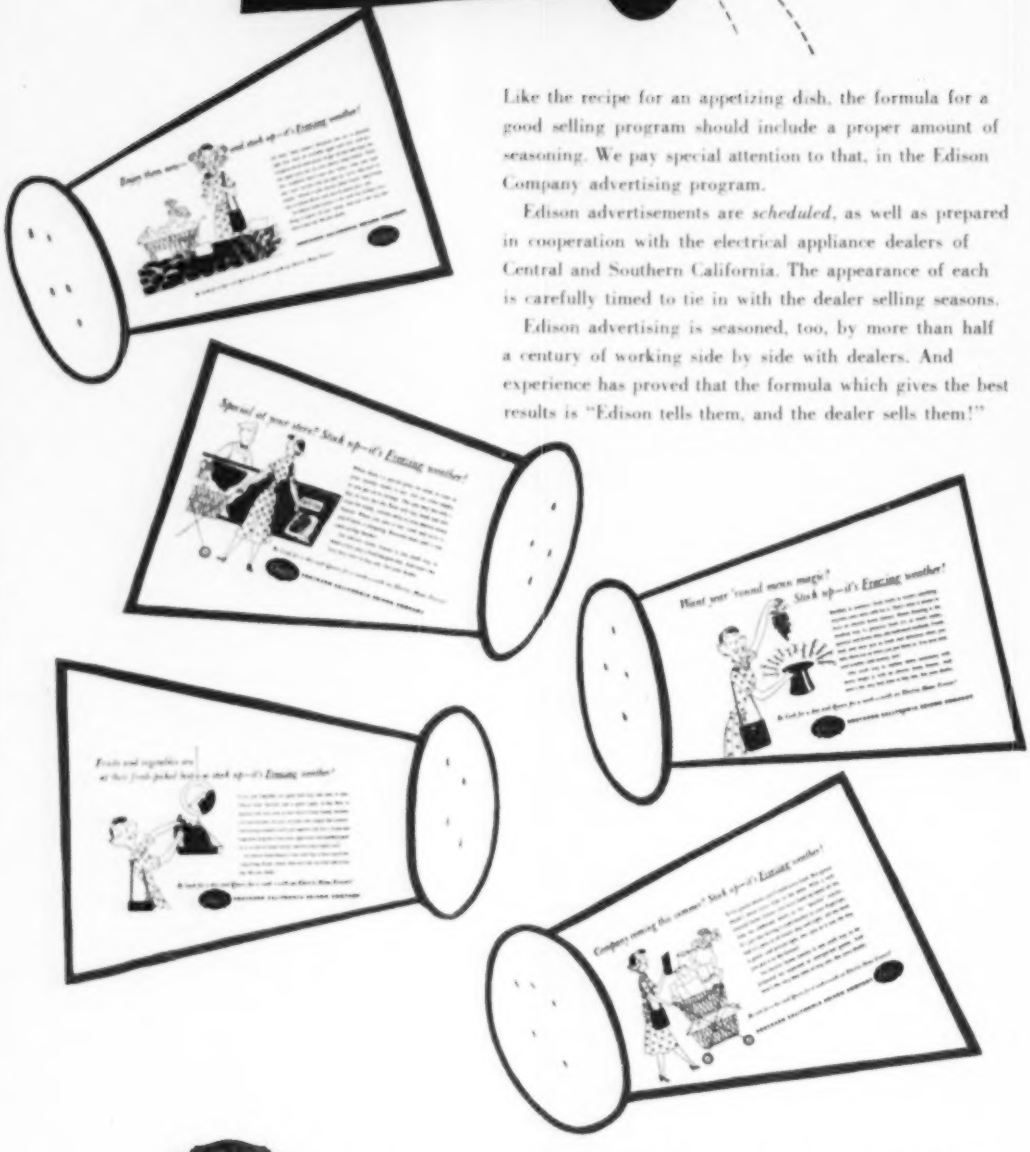
ELECTRICAL WEST

August 1950
25 Cents

Socialism is Like Polio, Page 59
Appliances, Page 83

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

well seasoned



Like the recipe for an appetizing dish, the formula for a good selling program should include a proper amount of seasoning. We pay special attention to that, in the Edison Company advertising program.

Edison advertisements are *scheduled*, as well as prepared in cooperation with the electrical appliance dealers of Central and Southern California. The appearance of each is carefully timed to tie in with the dealer selling seasons.

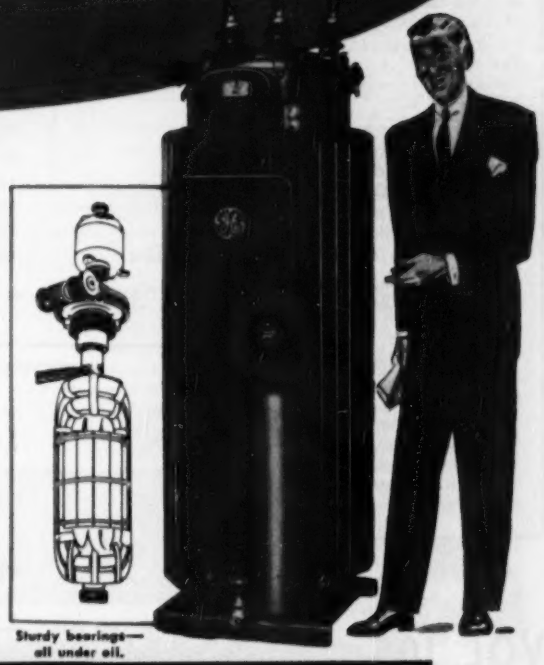
Edison advertising is seasoned, too, by more than half a century of working side by side with dealers. And experience has proved that the formula which gives the best results is "Edison tells them, and the dealer sells them!"

Edison SOUTHERN CALIFORNIA EDISON COMPANY

Requires Less Maintenance

than any other regulator you can buy...

GENERAL ELECTRIC IRS INDUCTION VOLTAGE REGULATOR



Sturdy bearings—all under oil.

★ No contacts in the main circuit.

★ No cams or springs or elaborate gear trains.

★ No mechanical brake to adjust, no separate braking circuit.

★ Even the oil lasts longer—because the tank is sealed to stop all breathing.

General Electric IRS induction voltage regulators give accurate, stepless regulation—with no time-delay. They respond immediately and will correct the voltage at an average rate of 1 per cent in 1½ seconds throughout the entire range of ±10% regulation.

And—no other regulator can match them in low maintenance costs. Ask for Bulletin GEA-2985.

Apparatus Dept., General Electric Company, Schenectady 5, New York.

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

AUGUST 1950

SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S.
The all-industry magazine of progress, established 1887, and incorporating the "Electrical Journal," "Journal of Electricity, Power and Gas" and "Journal of Electricity." Contents copyright, Sixty-second year of publication

ELECTRICAL WEST

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John Coots, Typography

NEXT MONTH

The September issue will be our annual lighting number. Featured will be an interpretative report of the Illuminating Engineering Society's national convention to be held in Pasadena in August. Also there will be a pictorial section showing good lighting jobs in the West. Coverage will include the model lighted home sponsored by the Northern California Electrical Bureau: new techniques in classroom lighting; continuous-strip fluorescent lighting of a vehicular tunnel, and many others.

The general interest lead article will be a piece by Thomas W. Delzell. It will be a clear-cut rationalization of the relationship between private and municipal utilities and the federal government in the development of major hydro resources. It is in the nature of a recommendation to Truman's Water Resources Policy Commission now holding hearings.

In engineering there will be a pictorial coverage of the new 300,000-kw. Moss Landing steam plant of PG and E: an article on the characteristics of electric house heating approached from a new standpoint: noise elimination from a large unit substation, and a fine discussion on the timely subject of watthour meter obsolescence.

The issue also will carry the regular features — news letters, new product and bulletin announcements, news and personals.

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Cover photo: Boom-mounted platform for line work, Portland General Electric Co.

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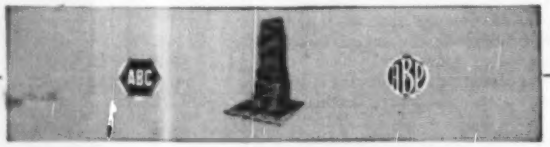

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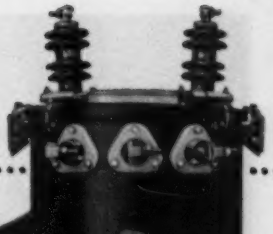
VOL. 105 NO. 2

L-M Announces



a revolutionary new development in transformer oil

protected with

ORTO

"ORTO"* brand oil is a revolutionary new inhibited oil that resists oxidation, acidification, and sludging. It lasts several times as long as a high-grade conventional oil. Therefore it offers these advantages:

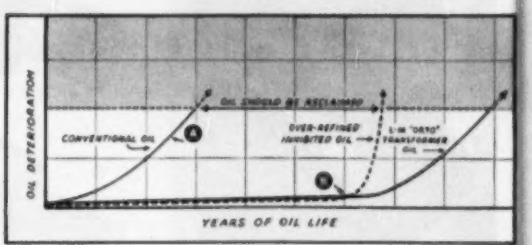
1. **Improved overload capacity**
2. **Longer transformer life**
3. **Lower maintenance costs**

"ORTO" brand oil has been thoroughly tested. Its advantages are conservatively stated. It does not deteriorate suddenly after the inhibitor has been used up. In "ORTO" the inhibitor lasts many years. After that the oil still has inherently long life, with normal resistance and characteristics; and it then simply begins the normal rate of deterioration.

All this time "ORTO" has kept cooling oil passages clear of sludge, permitting the original unrestricted oil circulation, and maintaining the original high short-time overload capacity. By preventing the formation of acids, "ORTO" has protected cellulose insulation from deterioration, and has prevented the corrosion and rust caused by acidified oil.

"ORTO" brand oil is now available exclusively in L-M Round-Wound and other L-M distribution transformers.

Ask the L-M Field Engineer for complete information, or wire or write Transformer Sales Department, Line Material Company, Zanesville, Ohio (a McGraw Electric Company Division).



Comparative curves show the deterioration of transformer oil in service. A high-grade conventional oil deteriorates at a gradually accelerating rate. Over-refined oils may have a better response to the inhibitor; but once the inhibitor has been used up, the oil has little resistance to oxidation, and deteriorates rapidly. "ORTO" brand oil is a high-grade conventional oil with an inhibitor which greatly extends the beginning of the deterioration, which, when it finally starts, assumes the same gradual curve as with *any* high-grade conventional oil.

*Trademark

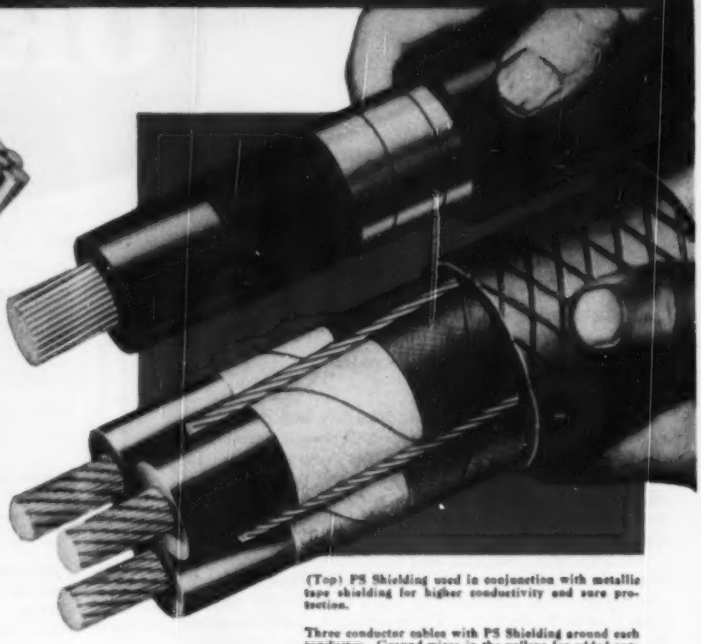
10-1

LINE MATERIAL... Transformers

What type of power cable

Unshielded? Metallic Shielded?

PS Shielding used directly over the conductor and also around the insulation.



(Top) PS Shielding used in conjunction with metallic tape shielding for higher conductivity and sure protection.

Three conductor cables with PS Shielding around each conductor. Ground wires in the valleys for added conductivity and strength. PS Shielding tapes coated with aluminum are used to identify a conducting tape.

Forms of PS Shielding

1. A thin coating or "skin" of conducting rubber.
2. A substantial sheath combining conductivity and mechanical protection.
3. A fibrous tape coated with conducting rubber.
4. A conducting paint or cement.

Who developed PS Shielding?

Research engineers at American Steel & Wire Company pioneered in this field many years ago. Since then, numerous other companies have been licensed to use conducting rubber tapes in electrical cable construction.

shall I use—

Non-Metallic PS Shielding?

● This subject has frequently come up for deliberation among outstanding power transmission engineers. They have thrown considerable light on the question and any buyer of cable will want to weigh the advantages and disadvantages of each type.

Unshielded insulated cable can generally be used up to 5000 volts without much trouble from corona and ozone formation.

Metallic Shielding in the form of metal tapes, wire braids and wire servings has been used with success under favorable conditions for cables 5000 volts and up. However, lack of flexibility may cause serious trouble. With expansion and contraction, bending and straightening, the metal shield tends to separate slightly from the insulation forming air gaps. Each air gap is a potential danger point causing spark discharges with corona and ozone formation—highly deteriorating to an organic insulating material.

Non-metallic PS Shielding with conducting tapes for cables 5000 volts and up, eliminates many of the weaknesses of metallic shielding. PS Shielding consists of a fibrous tape coated with a conducting rubber. It stays flexible—remains in intimate contact with the conductor or insulation. No air gaps can form and destructive sparkling is prevented. Corona is definitely eliminated—and so is ozone.

Type PS Shielding may be used alone, in combination with ground wires, or as a supplement to metallic shielding. We are now able to offer a conducting rubber compound that will provide improved shielding for any type of high-voltage cable.

Write for our booklet, "Type PS Semi-Conducting Shielding" which gives complete information.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

American Electrical Wire and Cable

UNITED STATES STEEL

ISOLATE SERVICE ENTRANCE FAULTS

PROTECT TRANSFORMERS FROM SECONDARY FAULTS

MAKE BANKING OF SECONDARIES POSSIBLE

with the

KEARNEY Secondary Fuse Cutout

Here is the most efficient inexpensive way possible to protect expensive transformers and other equipment from secondary faults.

Sturdily constructed of non-metallic material this cutout transfers current from the secondary to the top directly through the link itself with no intermediate connection or transfers.

Designed without nuts or bolts to tighten — refusing and installing is a matter of seconds.

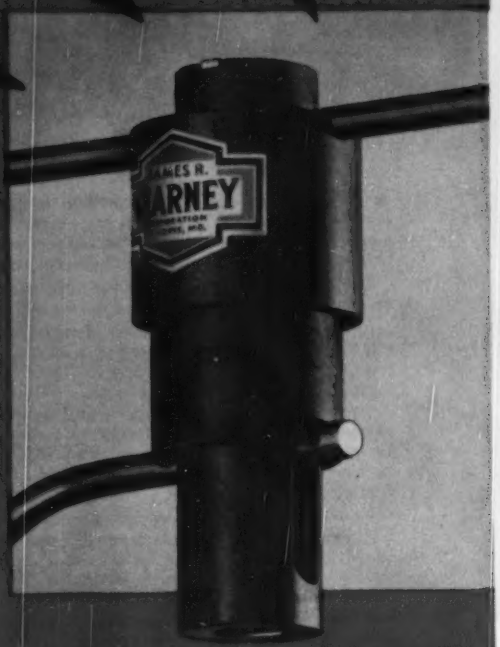
Write for more detailed information.

JAMES R. KEARNEY CORPORATION

4224-42 Clayton Ave., St. Louis 10, Missouri

Canadian Plant: Guelph, Ontario

West Coast Distributor:
RATHWELL and HARTZELL, Inc.



STEP ONE STEP TWO STEP THREE

STEP ONE: Drop the fuse link in the top opening of the cutout. Then, compress the lower shell and insert the top wire in the hole provided in the link.

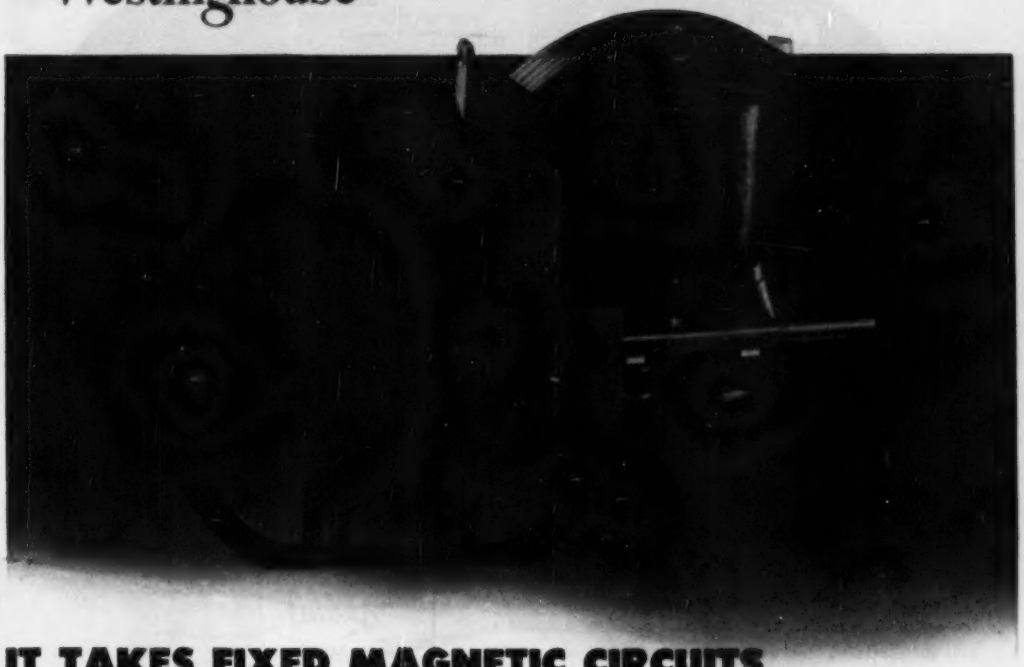
STEP TWO: Compress top shell and twist to the right or left so that it stays in the open position.

STEP THREE: Hang the cutout on the secondary, release top shell by twisting to make the final pressure contact with the secondary.

JAMES R. KEARNEY

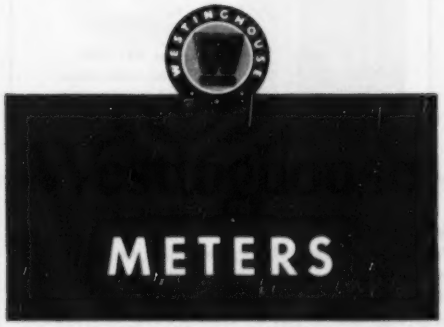
BETTER CONSTRUCTION Safer MAINTENANCE

YOU CAN BE SURE.. IF IT'S
Westinghouse



IT TAKES FIXED MAGNETIC CIRCUITS

FOR *Sustained Meter Accuracy* *



Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle, Denver

Magnetic circuits *can't* change when meter core laminations are made in one piece. Only Westinghouse offers this feature. You get *permanent* performance characteristics.

All parts are built integral with the electromagnet. Calibration is not disturbed even when the electromagnet is removed and replaced.

This is the kind of construction that assures SUSTAINED meter accuracy . . . without attention or extra expense.

Important to you in buying meters? Certainly, because it saves you money. Your own records will prove it.

Get the complete story in the new booklet, "What It Takes for Long-time, Low-cost Metering", B-4665. Call your nearest Westinghouse office or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Penna. J-40370

*A VITAL PART OF LONG-TIME, LOW-COST METERING

Main and Range "Plus"

Cat. No. 662-104—parallel hook-up
Cat. No. 662-204—series hook-up
Available Surface or Flush

Another Addition to

General's Line of Pullout Combinations

HERE is the latest product of General engineering—*another* new triple pullout combination specially designed to save the contractor time and trouble on installations requiring both a main and range combination and an *additional* switch for clothes dryer, water heater, pump or any other 220V, 30 or 60 Amp. circuit.

Available with either series or parallel connection, the new units are adaptable to many wiring requirements—special internal construction permits individual wiring of the lower pullout switch where separate metering is required—the series unit may be energized through its subfeed lugs from General's 100 Amp. fusible main pullout switch, thereby making the three pullouts available as individual branch switches. The parallel connected unit has 100 Amp. main lugs.

The next time ask for the new Main and Range *"Plus"* and learn why *"The Switch is to* General".

Write for latest Catalog 4809 and Supplement 4911.

Sold exclusively through wholesalers.

General
Cat. No. 666-108
Triple pullout combination with eight plug fused branch circuits.
General
Cat. No. 1100
100 Amp. fusible pullout suitable for use as service entrance or branch switch.

General Switch Corp.
49 Roebling Street Brooklyn 11, N. Y.

One of the leading Manufacturers of:

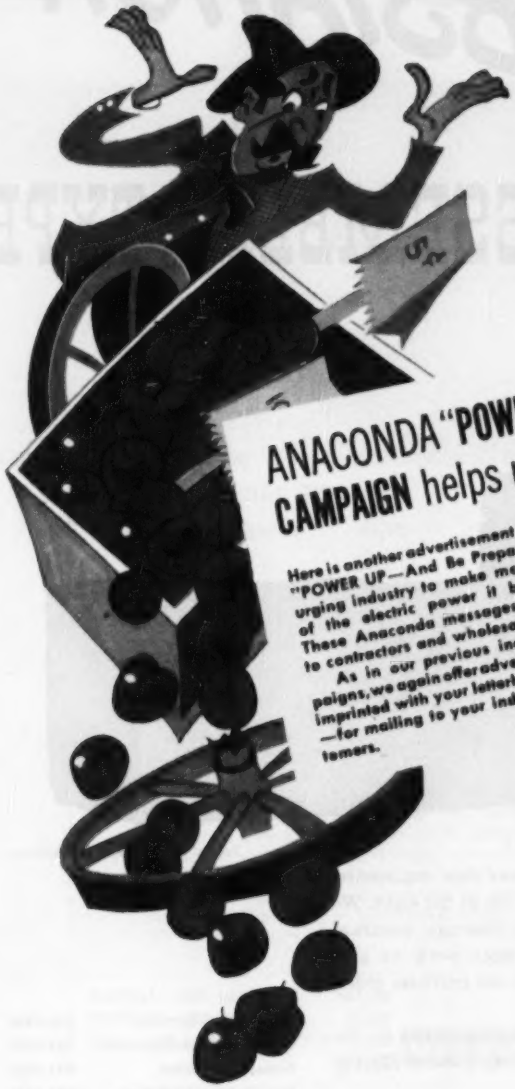
SERVICE EQUIPMENT . . .
Pullout, Front Operated Toggle and Side Operated types. Indoor—surface or flush, and Outdoor.

SAFETY SWITCHES . . .
30 through 1200 Amp., 250 V and 600 V Type A, C and D. Indoor and outdoor. HP rated.

ELECTRICAL DISTRIBUTION EQUIPMENT

SALES OFFICES IN EVERY MAJOR CITY

careful!

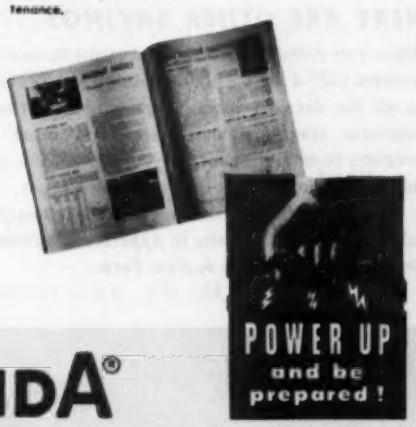


Overloaded wiring may upset your applecart, too!

In fact, it's happening to **9** out of **10** plants—
an happen to *your* plant if you are
on an obsolete wiring system . . . wir-
st can't deliver the power you pay for
hines you must run.

r, power loss means profit loss every
ute. Before you suffer breakdowns—
adequate wiring blocks expansion,
ulting, utility or plant power en-
mportant of all, get your copy of
—And Be Prepared," a complete
systems and maintenance. This
elp you survey your plant for a
..iring job that will pay for itself
... money saved later.

FREE! A complete guide to plant wiring and maintenance.



ANACONDA "POWER UP" CAMPAIGN helps utilities

Here is another advertisement in Anaconda's "POWER UP—And Be Prepared" campaign urging industry to make more efficient use of the electric power it buys from you. These Anaconda messages are also going to contractors and wholesalers.

As in our previous industry-wide campaigns, we again offer advertisement reprints, imprinted with your letterhead and message —for mailing to your industrial power customers.

The right cable for the job

ANACONDA®
WIRE AND CABLE

UNIT SUBSTATION *over* FIELD-ASSEMBLED TYPE

Typical G-E Master Unit Substation

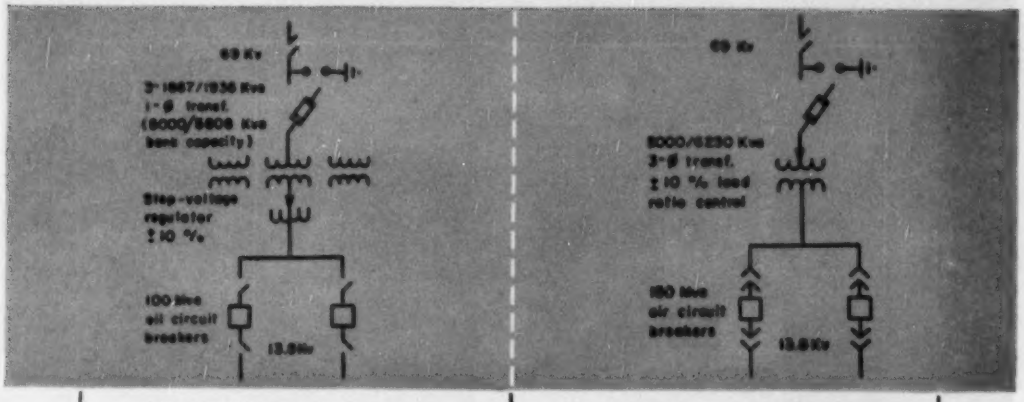
HERE ARE OTHER SAVINGS.....

When you order General Electric Unit Substations your engineering involves only a simple one-line diagram like the one at the right. We do all the detailed specs, prepare construction drawings, electrical diagrams, operating instructions and other paper work to give complete co-ordination of the project—all this on one purchase order, and at lower costs than field-assembled types.

For further information ask your G-E Sales Representative for the publications listed or write to *Apparatus Department, General Electric Company, Schenectady 5, New York.*

Master Unit Substations	GEA-3800
Single-circuit Unit Substations	GEA-4300
Package Substations	GEA-4500
Rural Package Substations	GEA-5276

SAVES 8.7%



FIELD-ASSEMBLED TYPE		G-E UNIT SUBSTATION	
MATERIAL AND LABOR	$66,182	MATERIAL AND LABOR	$60,424
OVERHEAD (20%)	13,236	OVERHEAD (20%)	12,085
	$79,418		$72,509

SAVINGS by installing G-E UNIT SUBSTATION $6,909 or 8.7%

In this typical cost analysis* that shows the obvious advantage of using General Electric Unit Substations purely from an investment standpoint, the labor estimates on both jobs were the minimum, a factor that favored the field-assembled type. As G-E Unit Substations arrive in large, completely-assembled units they are installed faster and easier, with lower labor costs.

Note that 20% overhead was added in both cases. For a comparison of *real costs*, 10% on the G-E Unit Substation against 20% on the field-assembled type would be more reasonable. Overhead is reduced when you order G-E Unit Substations because weeks spent in tedious engineering and detailing individual items are eliminated, at definite savings to you. Another item in favor of the G-E Unit Substation is its fan-cooled rating—442 kva greater than the field-assembled job. At a conservative $5 per regulated kva this gives you further savings in favor of the Unit Substation.

*For one installation in 1949.

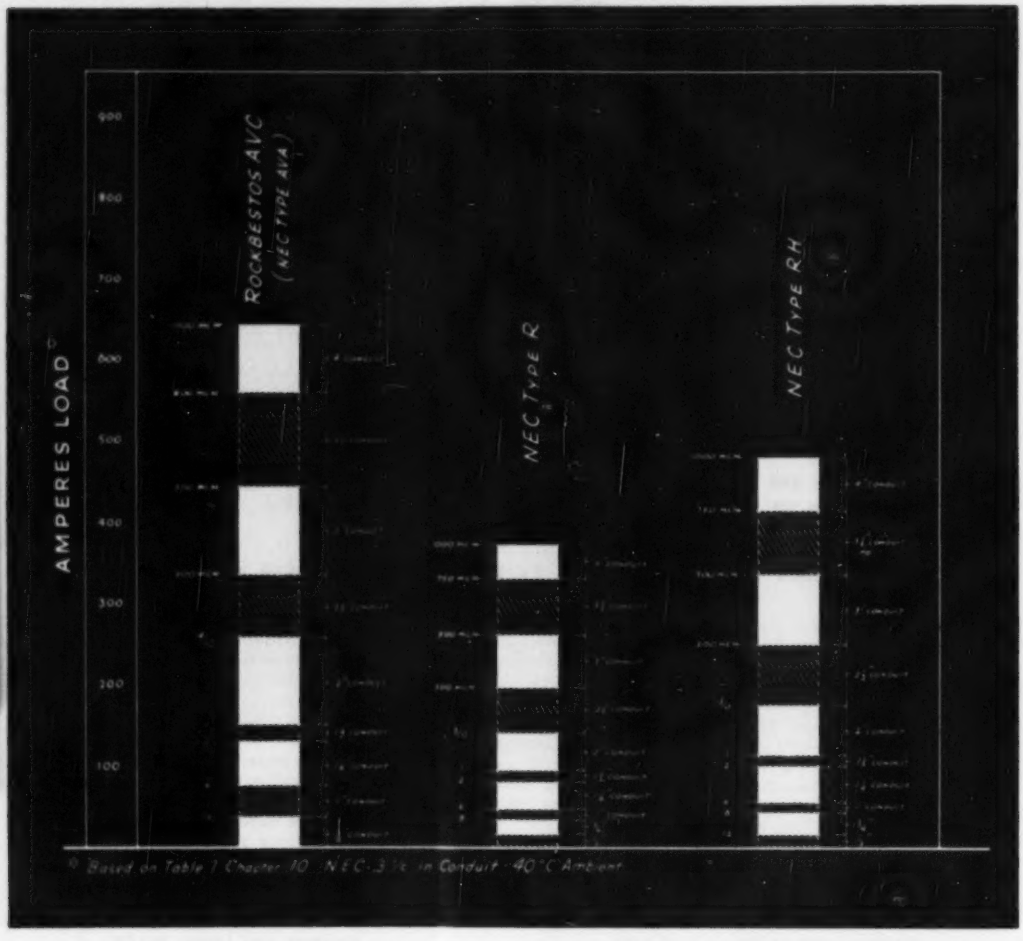
MATERIAL AND LABOR	$66,182		MATERIAL AND LABOR	$60,424
OVERHEAD (20%)	13,236		OVERHEAD (10%)	6,042
EXTRA FAN-COOLED CAPACITY	2,210	LET'S EVALUATE		
	$81,628			$66,466

SAVINGS by installing G-E UNIT SUBSTATION $15,162 or 18.6%

GENERAL ELECTRIC

With Factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities

Are Electrical Loads Outgrowing Your Conduit?



Here's the fast, inexpensive way to take care of electrical loads that have outgrown their conduits — just replace present cable with Rockbestos A.V.C. . . . *with Rockbestos A.V.C. you can increase conduit capacity without increasing conduit size.*

Use A.V.C. whenever load growth outruns present wiring. With it you can easily increase capacity without buying and installing larger conduit or fittings. Write today for the booklet "Rx for a Building with Hardening of the Electrical Arteries."

ROCKBESTOS PRODUCTS CORPORATION
NEW HAVEN 4, CONN.

NEW YORK CLEVELAND DETROIT CHICAGO
PITTSBURGH ST. LOUIS LOS ANGELES OAKLAND, CAL.

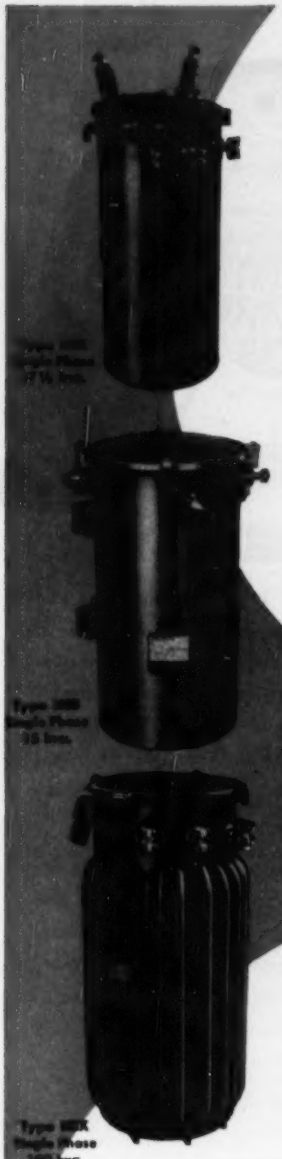
ROCKBESTOS A.V.C.
has a HIGHER AMPERE RATING

OFFICE & WAREHOUSE, OAKLAND MUNICIPAL AIRPORT, OAKLAND, CAL.; LOS ANGELES DISTRICT OFFICE, 6919 SAN FERNANDO RD., GLENDALE, CAL.

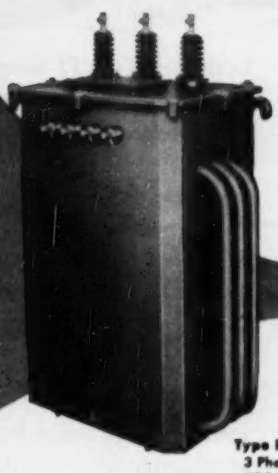
Wagner Distribution Transformers

are Standardized in every rating and design

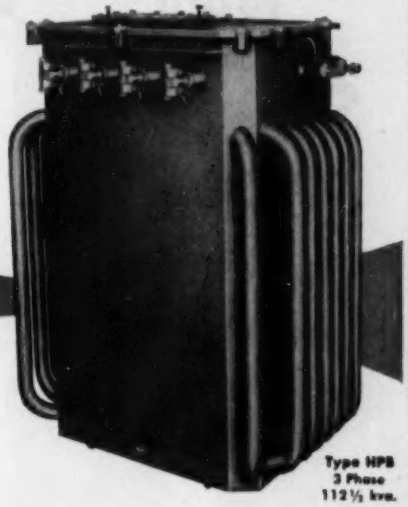
IN ACCORDANCE WITH E.E.I.—NEMA FOURTH REPORT



Wagner's complete line of distribution transformers includes every rating and design listed in the E.E.I.—NEMA Fourth Report—no matter what your particular requirements may be . . . there's a Wagner transformer to fit your needs.



Type HPK
3 Phase
45 kva.



Type HPB
3 Phase
112½ kva.

You save time, money and worry when you make your selection from Wagner's widely diversified line of distribution transformers—you get the benefit of Wagner's quality construction, improved design, and high efficiency with *standardized* mechanical features in ratings of 500 kva and below—15,000 volts and below.

Wagner has a nationwide organization to provide fast, convenient service, with 29 branch offices in principal cities ready to help you with your transformer problems. Bulletins TU-180 and TU-181 give complete information on Wagner Transformers.

Wagner Electric Corporation EST. 1891

WAGNER ELECTRIC CORPORATION
6381 Plymouth Ave., St. Louis 14, Mo., U.S.A.

ELECTRIC MOTORS · TRANSFORMERS · INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS – AIR AND HYDRAULIC

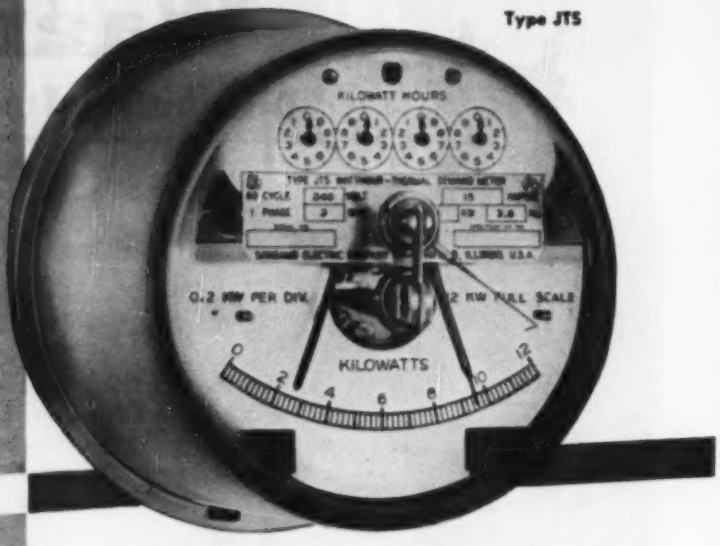
BRANCHES IN 29 PRINCIPAL CITIES

Smaller Size for Convenient Installation

in minimum space

New Sangamo Type JT

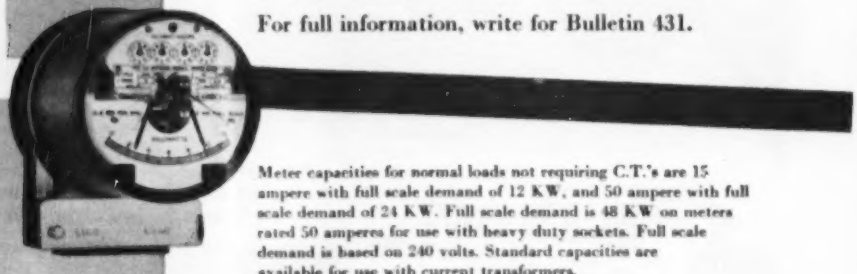
Combination Watthour-Thermal Demand Meters



In the new Type JT meter line, Sangamo has combined two *completely independent* elements in a single meter case that requires only the space normally provided for conventional watthour-demand meter installations. Sangamo Type JTA and Type JTS Combination Watthour-Thermal Demand Meters are designed for convenient demand measurements on all types of single-phase loads.

The watthour meter element in the new line incorporates all the service proven features of the standard Sangamo Type J Meter. The thermal meter element design is the result of many years of experience with Lincoln Thermal Demand Meters. These two elements operate completely independently of each other.

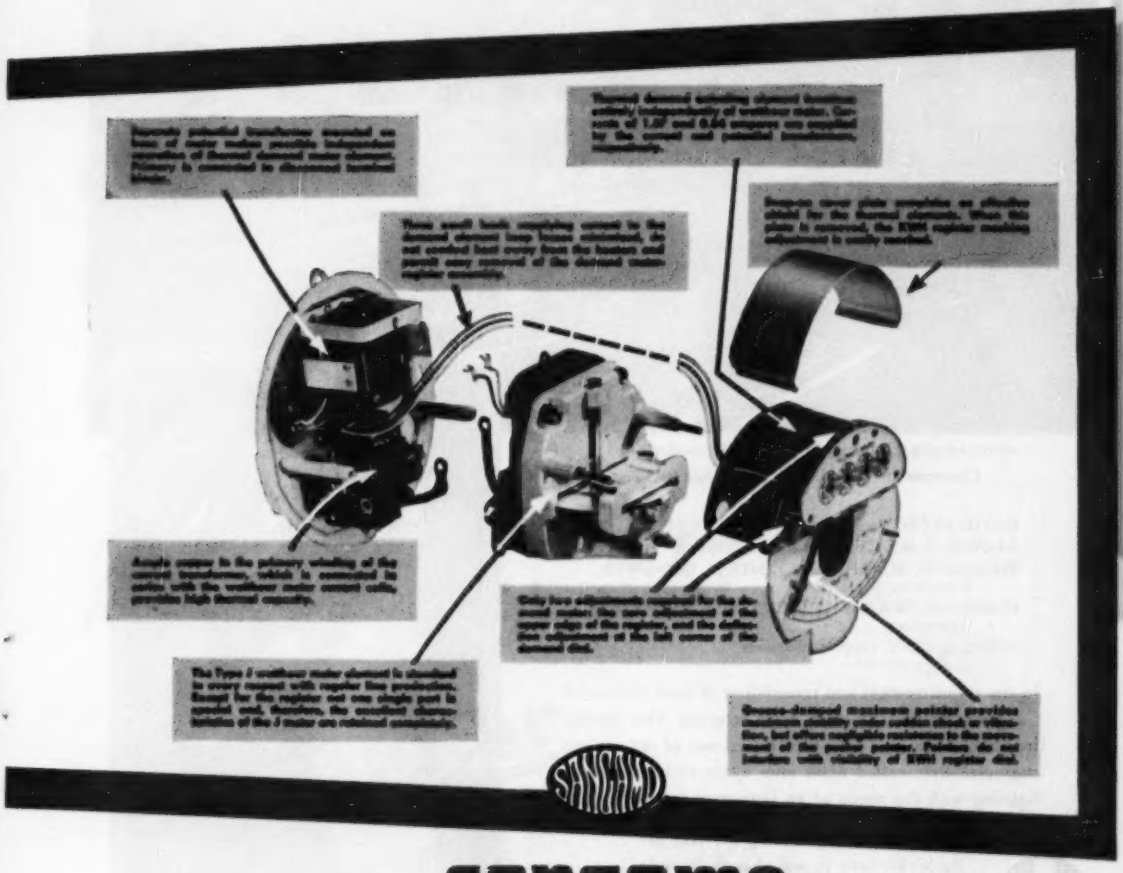
For full information, write for Bulletin 431.



Meter capacities for normal loads not requiring C.T.'s are 15 ampere with full scale demand of 12 KW, and 50 ampere with full scale demand of 24 KW. Full scale demand is 48 KW on meters rated 50 amperes for use with heavy duty sockets. Full scale demand is based on 240 volts. Standard capacities are available for use with current transformers.

DESIGN FEATURES

- The operation of the Type J and Lincoln meter elements are completely independent.
- Established characteristics of both the watthour meter and the demand meter are not affected through the combination of the two functions.
- Losses in leads and heaters of the thermal elements are exceptionally low because of the small current (1.8 amperes) required for full scale indication.
- Thermal element is completely shielded against external heating effects or temperature gradients within the meter.
- Frictionless, grease damped, maximum demand pointer, stabilized against motion from vibration or shock.
- Independent construction, the use of a standard J watthour meter element, and complete accessibility of all parts, including adjustments, minimizes maintenance costs.



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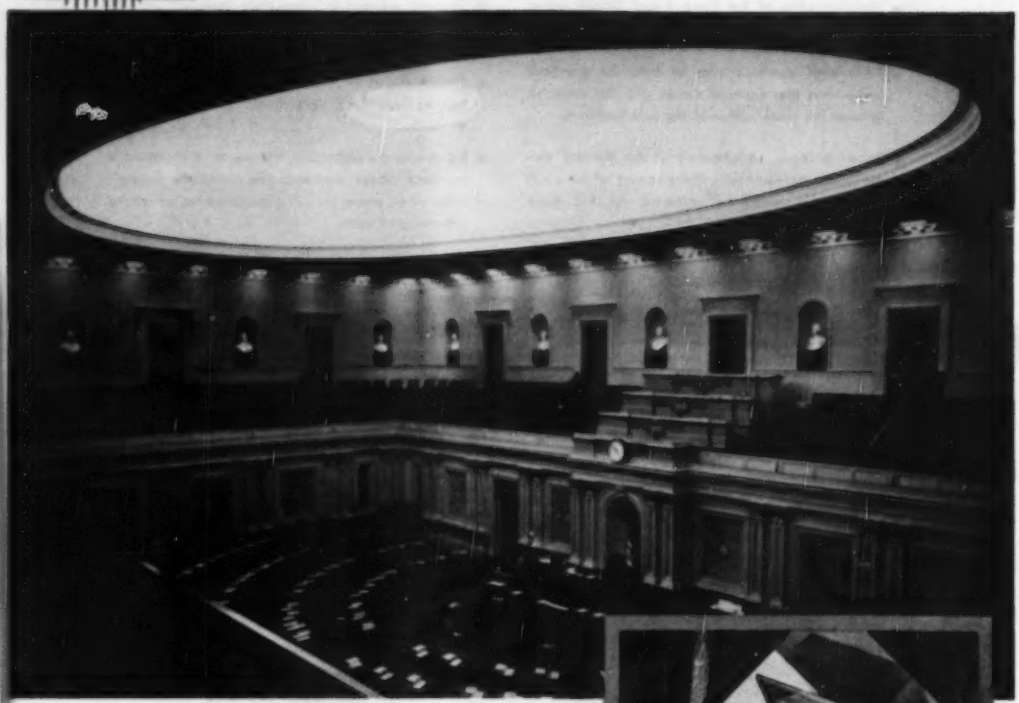
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

HOLOPHANE Lights Both Houses of Congress

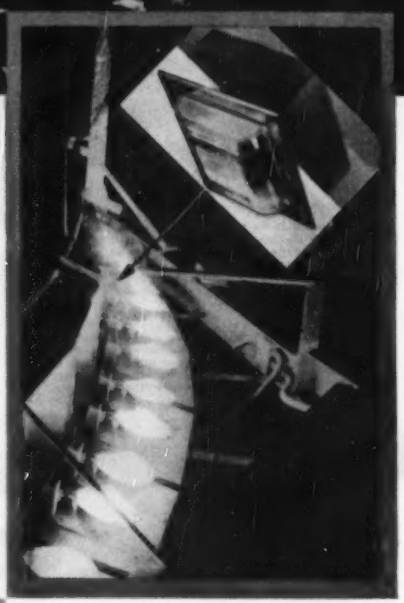


HOLOPHANE Lighting in the newly modernized Chamber of the United States Senate.

DAVID LYNN, *Architect of the Capitol*
FRANCIS P. SULLIVAN, *Associate Architect*
THOMAS W. MARSHALL & JAMES M. GONGWER, *Consulting Engineers*
HARBESON, HOUGH, LIVINGSTON & LARSON, *Consultants*
LEO H. CLEARY, *Electrical Engineer*

In the reconstruction and remodeling of both Houses of Congress, HOLOPHANE units were selected. The specialized knowledge and long-time experience of HOLOPHANE engineers were called upon once again to integrate the lighting with the needs of an important interior.

HOLOPHANE *Engineering Service, for which there is no charge, stands ready to help you with your needs.*



CONTROLENS* installation around cove—units open for relamping.

*Reg. U. S. Pat. Off.

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Lighting Authorities Since 1898 • 342 MADISON AVENUE, NEW YORK 17, N.Y.
THE HOLOPHANE COMPANY, LTD., THE QUEENSWAY, TORONTO 14, ONTARIO

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Give me those WIDE OPEN SPACES
"DON'T CRAMP MY STYLE WITH KNUCKLE SCRAPERS . . . GIVE ME Murray BOXES . . . THEY'VE GOT PLENTY OF WORKING SPACE"
MORE THAN 6 INCHES LONG AND WIDE!
These Murray meter connection boxes are suitable for both indoor and outdoor use. Plenty of room for quick, economical wiring. Why put up with knuckle scrapers that cost you money in lengthy installation time?
Got a lot of wires to bend? Here's room to bend and more! Installation is quick, sure, economical. How many meters will your company install in the next year? 1,000—10,000—To see how much you can save with Murray boxes, just multiply your figure by the ten minutes or more your installer can save on each installation.
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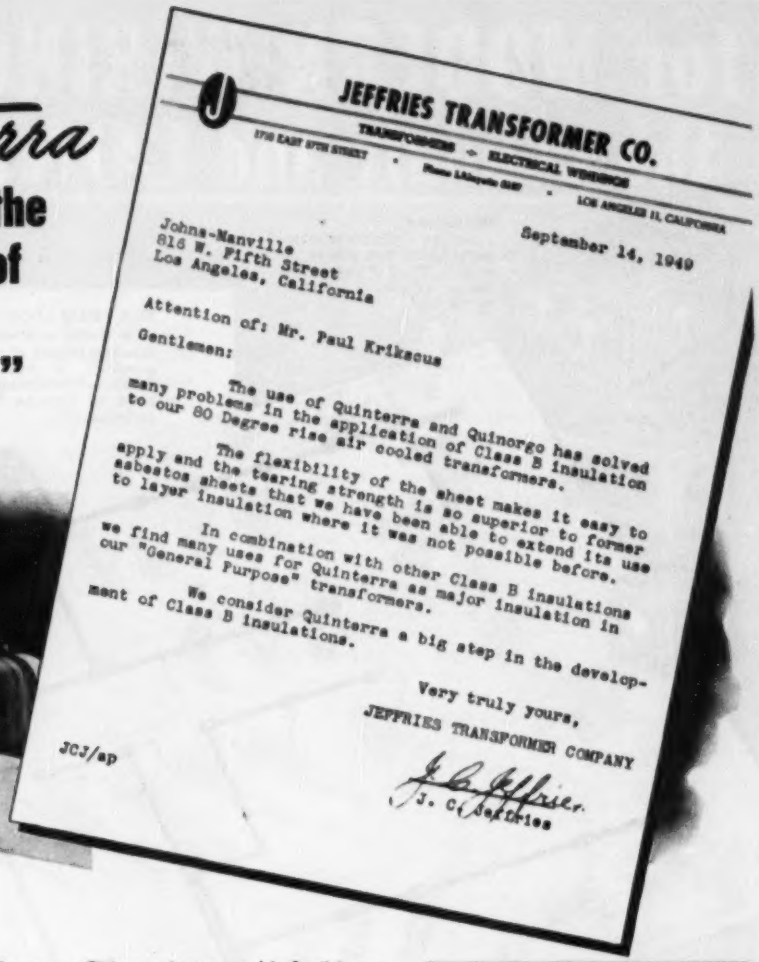
SWITCHES • CURRENT LIMITING REACTORS • CROWS'NEST AERIAL LADDERS
WRITE FOR BULLETIN 501B

"We consider *Quinterra* a big step in the development of Class B insulations . . ."



JEFFRIES TRANSFORMER CO.
TRANSFORMERS — ELECTRICAL WINDINGS
1715 EAST 15TH STREET • Phone LAfayette 6107 • LOS ANGELES 11, CALIFORNIA

September 14, 1949

Johns-Manville
815 W. Fifth Street
Los Angeles, California

Attention of: Mr. Paul Krikscus

Gentlemen:

The use of Quinterra and Quinorgo has solved many problems in the application of Class B insulation to our 80 Degree rise air cooled transformers.

The flexibility of the sheet makes it easy to apply and the tearing strength is so superior to former asbestos sheets that we have been able to extend its use to layer insulation where it was not possible before.

In combination with other Class B insulations we find many uses for Quinterra as major insulation in our "General Purpose" transformers.

We consider Quinterra a big step in the development of Class B insulations.

Very truly yours,
JEFFRIES TRANSFORMER COMPANY

JCJ/ap

J. C. Jeffries

ONE AFTER ANOTHER, transformer companies like Jeffries are "discovering" Quinterra—the revolutionary, new Johns-Manville purified asbestos, high-temperature, electrical insulation.

. . . And, like Jeffries, they're discovering that Quinterra in a transformer gives them important selling advantages . . . as well as providing many savings in transformer design and production.

Quinterra is a paper-thin flexible, continuous sheet insulation. It is being widely used for interlayer and wrapper insulation in transformers and coils.

Its lasting dielectric strength, due to its resistance to pyrolysis, assures a greater safety factor and longer operating life. Quinterra withstands substantially higher temperatures than the hot-spot limit of 130C for Class B insulations.

QUINTERRA

- ✓ **cuts factory rejects**
- ✓ **reduces complaints**
- ✓ **improves production rate**
- ✓ **produces more uniform product**
- ✓ **cuts costs of operations**

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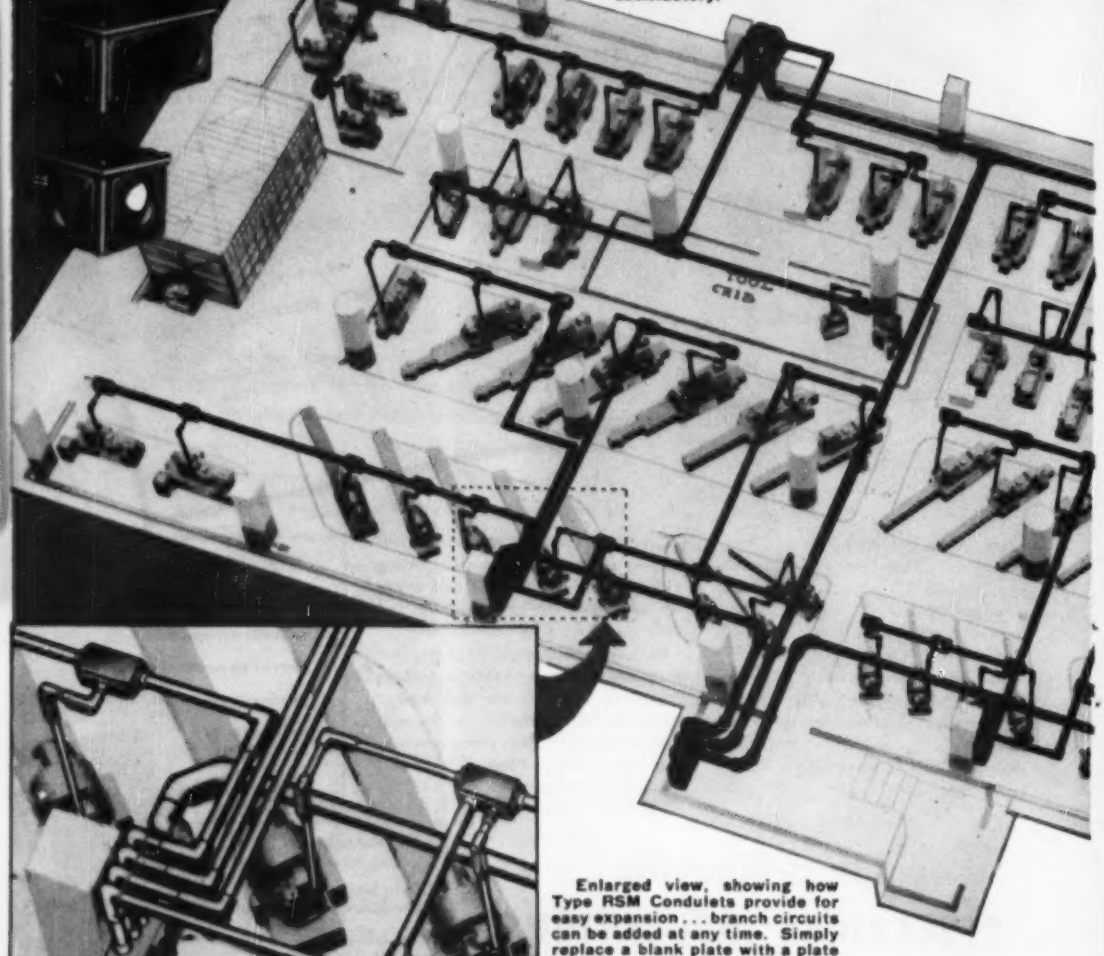
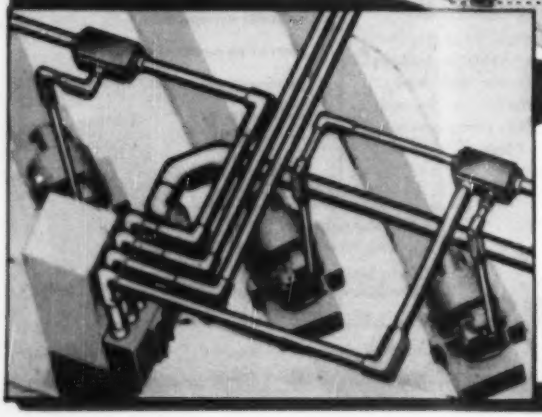
EW-8

for MODERN WIRING... the conduit and CONDULET*

THE "NEW LOOK" IN CONDULET INSTALLATION
A model of a screw machine department with a modern layout of cast Feraloy Condulets and rigid conduit. It has flexibility plus all the other Condulet advantages. The actual installation has been in service for several years and is highly satisfactory.



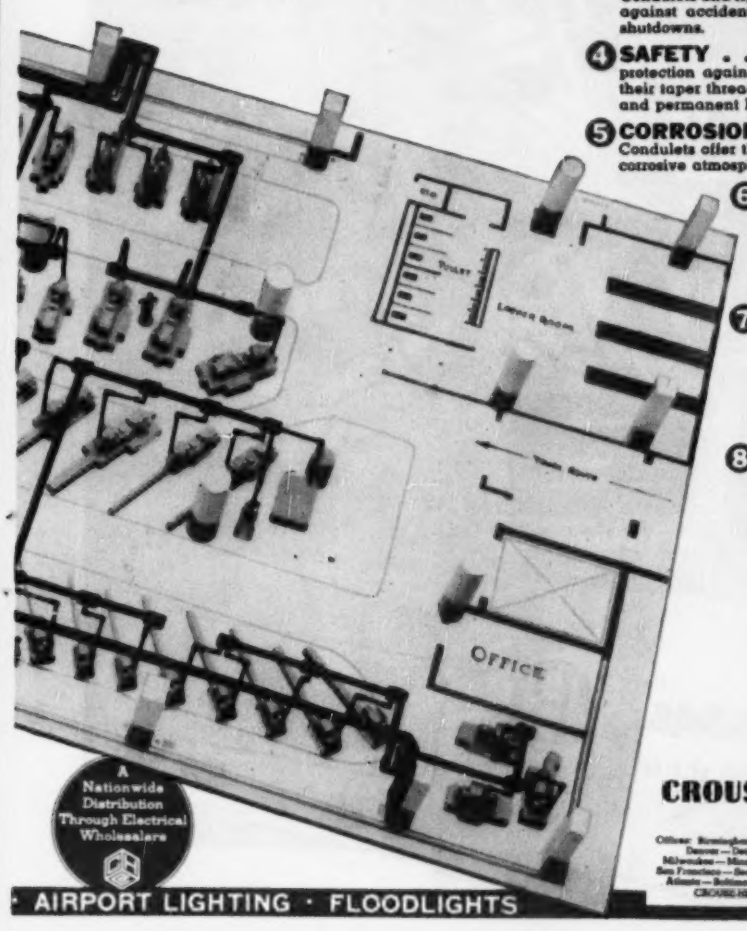


Enlarged view, showing how Type RSM Condulets provide for easy expansion... branch circuits can be added at any time. Simply replace a blank plate with a plate that has the required number and size of hubs.

CONDULETS · TRAFFIC SIGNALS

method gives YOU definite advantages!

NEW ways of using the familiar Condulet and conduit material have produced outstanding results. Modern installation layouts meet industry's modern needs for flexibility while retaining the enduring protection and safety that can only be given by cast Feraloy Condulets and rigid conduit.



1 FLEXIBILITY . . . A modern Condulet installation, like the one illustrated below, provides for the vigorous growth and changing conditions of a modern industry. The RS Series Condulets with their detachable hub plates make it easy to change circuits or add additional circuits at any time.

2 UNIVERSAL APPLICATION . . . Galvanized Condulets and galvanized rigid conduit may be used under all atmospheric conditions and occupancies.

3 MECHANICAL PROTECTION . . . Cast Feraloy Condulets and rigid conduit provide the best possible protection against accidental damage to the wiring — prevents costly shutdowns.

4 SAFETY . . . A Condulet installation gives maximum protection against personal injury and fires. Condulets with their taper threaded hubs and rigid conduit provide a reliable and permanent low resistance path to ground.

5 CORROSION RESISTING . . . Cast Feraloy Condulets offer the best protection wherever moisture, dust or corrosive atmospheres are present.

6 ECONOMY . . . Direct comparison of Condulet and rigid circuit installations with other wiring methods show comparable installed costs. The durability, safety, and low maintenance cost of Condulet installations produces savings which pay dividends over the years.

7 QUALITY . . . All Condulets are built to Crouse-Hinds' high standard of quality with painstaking care by skilled craftsmen. Thousands of Condulet installations that are still in active service after twenty, thirty, forty or more years offer positive proof that the trademark CONDULET stands for reliability and long life.

8 VARIETY . . . Thousands of types and sizes of Condulets, plugs and receptacles, and lighting fixtures are listed in the Condulet Catalog, including a complete explosion-proof and dust-tight line for use in hazardous locations. There is a Condulet for every purpose.

On your next electrical layout, whether modernization or new construction, plan to get all of the benefits of sturdy cast Feraloy Condulets and rigid conduit. Send for additional information on modern Condulet installation.

*CONDULET is a coined word registered in the U. S. Patent Office. It designates a product made only by the Crouse-Hinds Company.

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Quicker to use and neater in appearance, Briegel All-Steel Indenter Fittings not only make stronger connections but also make each job more profitable to the contractor and satisfactory to his customers.

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A new electrical raceway has been added to the famous Central Rigid Steel Conduit line . . . CENTRAL EMT. This new Spang product is a light-weight and easy-bending electrical raceway. It has an electro-galvanized finish on the outside and black enamel on the inside. CENTRAL EMT meets the Underwriters' Laboratories requirements and is approved by the National Electrical Code.

Friendly Central Conduit Distributors everywhere handle CENTRAL EMT. And they also handle CENTRAL LACO "HOT DIPPED", CENTRAL WHITE and CENTRAL BLACK to provide you with just the right conduit for any electrical raceway installation. What's more you'll find that Central Conduit Distributors are a dependable source of supply for many other electrical supplies.

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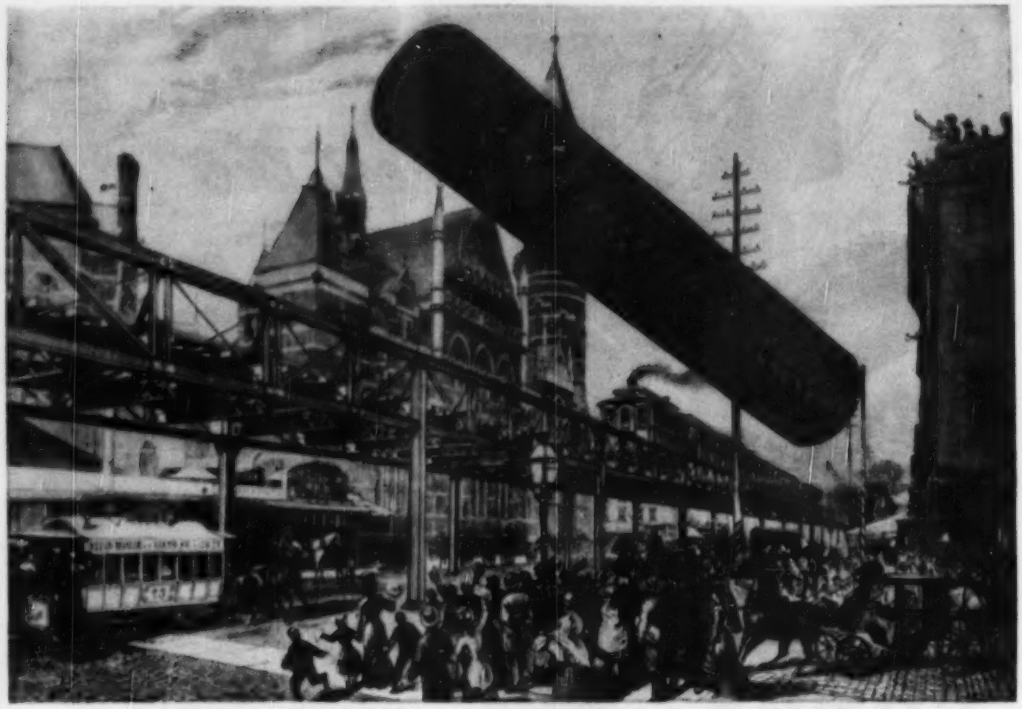
CENLACO a hot dipped galvanized and lacquered finish, inside and out.

CENTRAL WHITE electro-galvanized outside and black enameled inside.

CENTRAL BLACK permanent, baked-on black enamel finish, inside and out.

EMT—Light-weight electro-galvanized outside and durably lacquered inside.



Segment of Kerite cable after 50 years' service on the New York Sixth Avenue "el"

Returned to stock after 50 years' service

In 1889, a large amount of Kerite 600-volt telegraph cable was installed on the Sixth Avenue "el" in New York City. It was 19-conductor cable; all conductors were individually insulated No. 14 wire. The outer mechanical protection was provided by cotton braid, which was well preserved by painting.

Fifty years later, when the "el" was torn down, the Kerite cable was removed. The Kerite insulation was found to be live and sturdy. Electrical tests found the average breakdown voltage to ground of the 600-volt Kerite insulation on the 19 conductors to be 31.5 kv.

Most of the cable was returned to stock for future use!

Modern Kerite cable for similar service uses asbestos or glass braid which will not rot and which requires no maintenance. But the insulation itself is still made with the same Kerite that produced the insulation described here.

Kerite insulated wire and cable is available in many forms and for many purposes—low or high voltage, indoor, outdoor, aerial or submarine. Ask any Kerite user about its stamina and low cost per year. *The Kerite Company, 30 Church Street, New York 7, N. Y.*

Offices also at: 122 S. Michigan Avenue, Chicago 3; 582 Market Street, San Francisco 4; 714 W. Olympic Blvd., Los Angeles 15.

Kerite Insulation—Your Cable's Best Life Insurance

KERITE CABLE

YOU CAN BE SURE.. IF IT'S
Westinghouse

A Quick Changer!

...for fast re-fusing..for higher capacity

Interchangeability keynotes Westinghouse porcelain-enclosed cutouts. Only Westinghouse gives you this versatility in line protection. Consider what this means:

First, fuse replacements are fast . . . safe . . . easy. Lineman removes door with hookstick—replaces it with a fused door. Fuse links can be replaced at the truck or in the shop.

Second, as line capacity outgrows the cutout interrupting rating, the EA cutout door may be replaced with the new Type HC (high interrupting capacity) door—either dropout or non-dropout type. That's because *any* door will fit *any* housing.

In addition, you get greater safety; complete hookstick operation; 180° dropout for clear indication of blown fuse; cool operation; light weight combined with great mechanical and electrical strength.

These cutouts are available now in a range of sizes to meet your requirements. See the versatility of this cutout. Ask your nearby Westinghouse representative or distributor for a personal demonstration and Booklets B-3833 and B-4299. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.
J-60705

1. **PRESTITE PORCELAIN HOUSING**—50-ampere, 5-kv, identical for both Type EA and Type HC cutouts.
2. **MOLDARTA TYPE EA DOOR**—1,200-ampere interrupting capacity.
3. **MOLDARTA TYPE HC DOOR**—Interchangeable with Type EA cutout door. Interrupting capacity 8,000 amperes at 2,500 volts, 5,000 amperes at 5,000 volts.

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FUSE CUTOUTS
FOR ANY SYSTEM

Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver.

ALL THE TOOLS YOUR LINEMEN NEED

FROM ONE NEAR-BY SOURCE!

they can go anywhere

Via Graybar, you can get performance-proved FWD trucks, with digger, derrick, or winch — equipped as you wish for any line construction or maintenance job. Your choice of body styles and sizes. These rugged trucks are built with the power to reach the hard-to-get-at construction and maintenance jobs. Trailers and dinkies also are in the Graybar line of "everything on wheels" for pole-line projects.

time-saving tools

From pliers to pike poles, clamps to cable cars, tree trimmers to tamping bars—Graybar offers a complete range of tools for every line job. Every product distributed by Graybar is well known and approved by linemen . . . every product is designed specifically to help linemen do the best work with maximum safety.

safety equipment, too

For handling the "hot" jobs, Graybar has Salisbury rubber line hose, insulator hoods, protective blankets, rubber coats, gloves, and sleeves. From this one convenient source you can also get Chance hot line tools, Klein safety straps, belts, climbers, M.S.A. first-aid kits, and all other items your linemen need for safety and efficiency.

stocks near-by

Stocks of hundreds of pole-line tools and equipment are maintained at Graybar warehouses in over one hundred cities. Often, prompt delivery from these local stocks saves valuable time. Your local Graybar Representative will be glad to give you information about tools or any of the 100,000 other electrical items distributed by Graybar. For special help on difficult problems, an experienced Graybar Outside Construction Specialist is at your service. *Graybar Electric Company, Executive offices: Graybar Building New York 17, N. Y.* 5066

Everything for your pole lines

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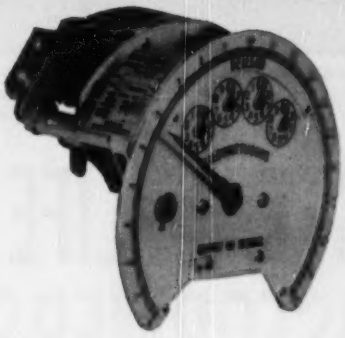
IN OVER 100 PRINCIPAL CITIES

FOR MEASUREMENT OF

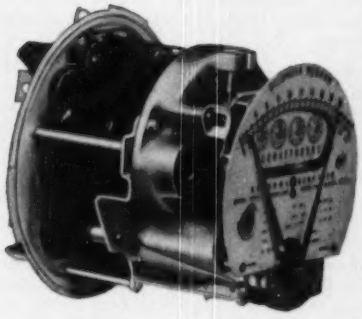
Small Demands—



TYPE M-30—DEMAND REGISTER

- M-30 *mechanical-type register* (for mounting on a watthour meter)—measures kilowatt demand.
- Demand register can be substituted for conventional register on many types of watthour meters and totalizing relays
- Positive reset
- Simple adjustments
- Minimum number of parts
- Moderate price, low installation cost.

Ask for publication GEC-413.



TYPE IHM—WATTHOUR DEMAND METER

- IHM *thermal-type meter* does the work of two meters—measures both kilowatt-hours and kilowatt demand
- "Direct-heat" principle produces high torque, permits large, sturdy parts
- Sustained accuracy at high and low loads
- No overshoot on transient loads
- Short testing time
- Low installation cost.

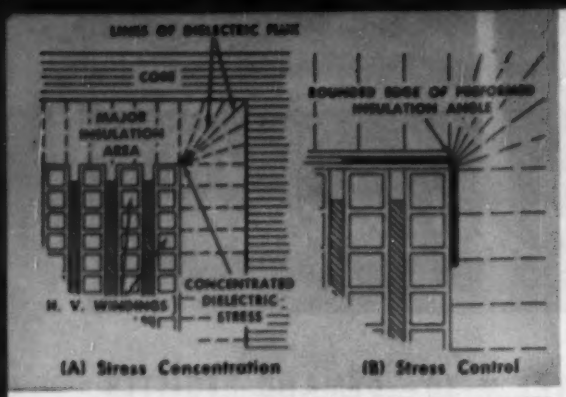
Ask for publication GEC-408.

General Electric's complete metering service can help you in two ways—by providing everything you need in metering service; by helping you apply it for proper results. Get in touch with your G-E representative for product and application assistance —now. Apparatus Department, General Electric Company, Schenectady 5, New York.

GENERAL ELECTRIC

605-47

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.



1 PRINCIPLE OF FITTING INSULATION right up next to areas of high dielectric stress, then reducing stress per unit area with rounded surfaces, is one of the methods used by Allis-Chalmers engineers to cut corona discharge.

2 PREFORMED INSULATION angles are fitted snugly against coils. This eliminates voids in critical regions and reduces concentration of dielectric forces to prevent corona formation. Die-forming of these angles on electronic heater insures exact fit, eliminates air pockets in insulation.

CORONA WON'T STEAL LIFE FROM THESE TRANSFORMERS

Transformers at Central Illinois Public Service Company Tell Story of Surge-Protected Insulation

WHAT MAKES a transformer grow old? One of the chief causes is internal corona discharge — an invisible hazard that can only be detected by accurate readings of cathode ray oscillograms. The presence of corona during operating surges *scores* insulation and causes gradual weakening of transformer impulse strength.

The complete solution to this problem is announced in the Allis-Chalmers corona-free design. By a combination of improvements, *all measurable effects of corona have been eliminated* — including effects that were not even detectable until recent years!

Insulation was moved right next to high voltage conductors, replacing "free space" with corona-resisting material in critical areas. Vulnerable parts of terminal boards were rounded and shielded to eliminate sharp contours. Dielectric fields were redirected, spacers redesigned and new materials used to completely "knock out" injurious corona.

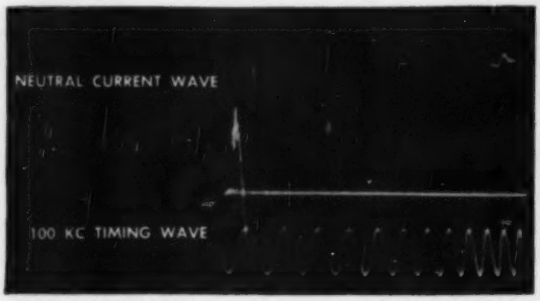
Protected by this design, Allis-Chalmers power transformers will retain their full impulse strength after repeated surges or switching.

To the nation's electric power producers — like Central Illinois Public Service Company, purchaser of the transformer pictured here — this design will mean greater operating confidence, more reliable service, and full return on invested capital.

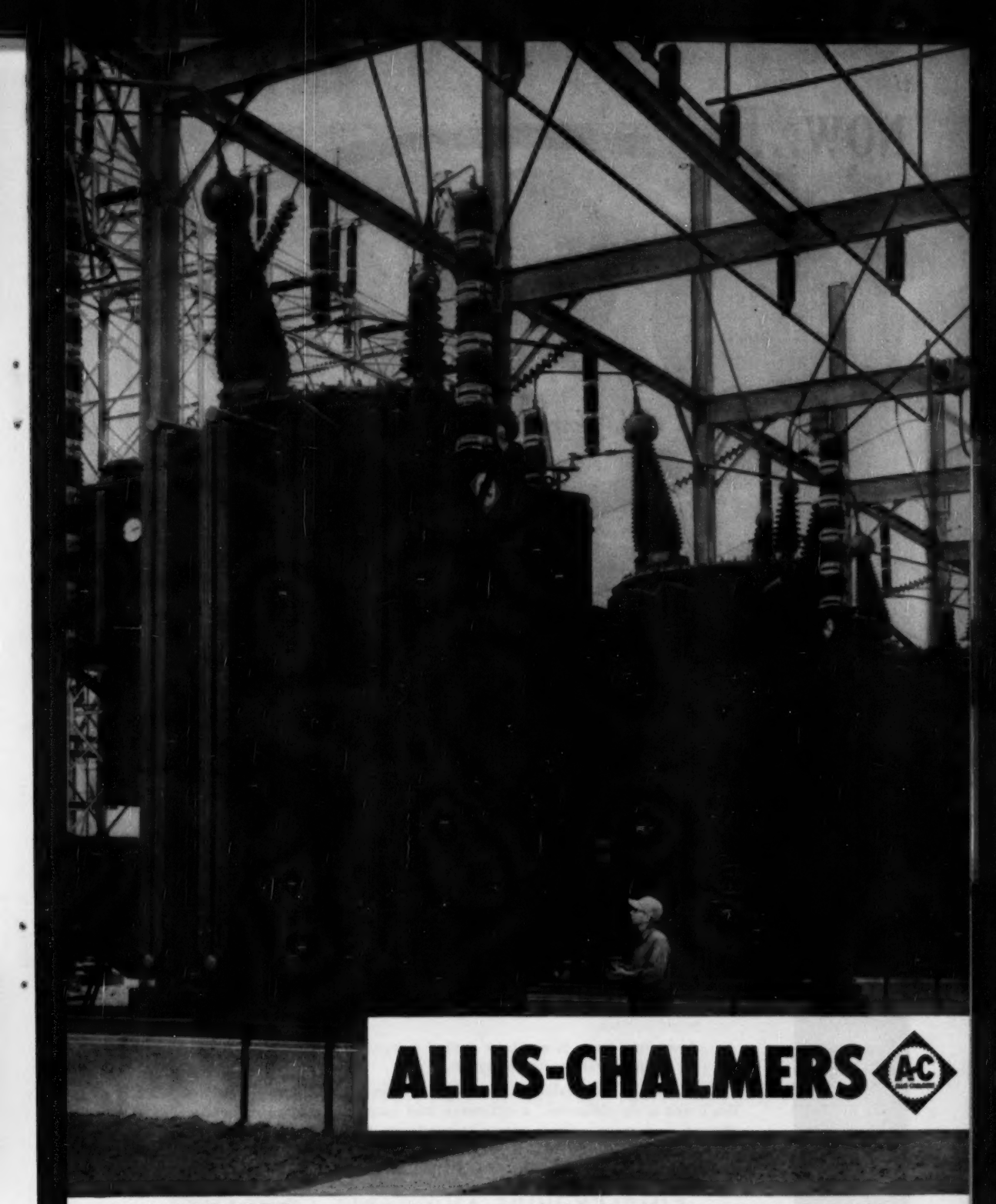
A-3092

ALLIS-CHALMERS, 939A SO. 70 ST.
MILWAUKEE, WIS.

3 ROUNDED SHIELDS distribute electrostatic flux around tap changer contacts to stop corona. Spacers between contacts and panel control dielectric stress between contacts, permit more compact assembly.



4 EVEN THE SMALLEST corona effect—smaller than that which could harm transformers in years of operation — can be detected with new oscillographic test techniques. Above is sample oscillogram taken during a transformer impulse test. Analysis of many such curves, taken under varying conditions, showed "no detectable corona discharge whatsoever" at over five times normal operating voltage.



ALLIS-CHALMERS

5 TO FURTHER PROTECT against surges, high and low voltage lightning arresters are mounted directly on transformers, close to the bushings. *Oil-Sealed* Inert Gas expansion tanks are mounted on side of transformers, near the ground, to increase overhead line clearances. Installed bank is rated 35,000/45,000 kva, 138 to 69 kv; equipped with ± 10% load ratio control

NOW...

MOISTURE RESISTANCE

OZONE RESISTANCE

RESISTANCE TO HEAT and AGING

...All Three In One High-Voltage Cable!

Study the facts behind high-voltage cable failures and you'll readily realize just how much moisture resistance, ozone resistance, and resistance to heat and aging mean to high-voltage transmission and distribution systems. Now — for the first time — all three properties are combined in a single insulation, Anhydrex XX — available only in Simplex-ANHYDREX XX Cables.

Aged in an air oven at the grueling temperature of 250 F. (121 C.), Anhydrex XX has proved itself to be far and away your most dependable assurance of low-cost, trouble-free cable operation at the higher voltages. Here's how:

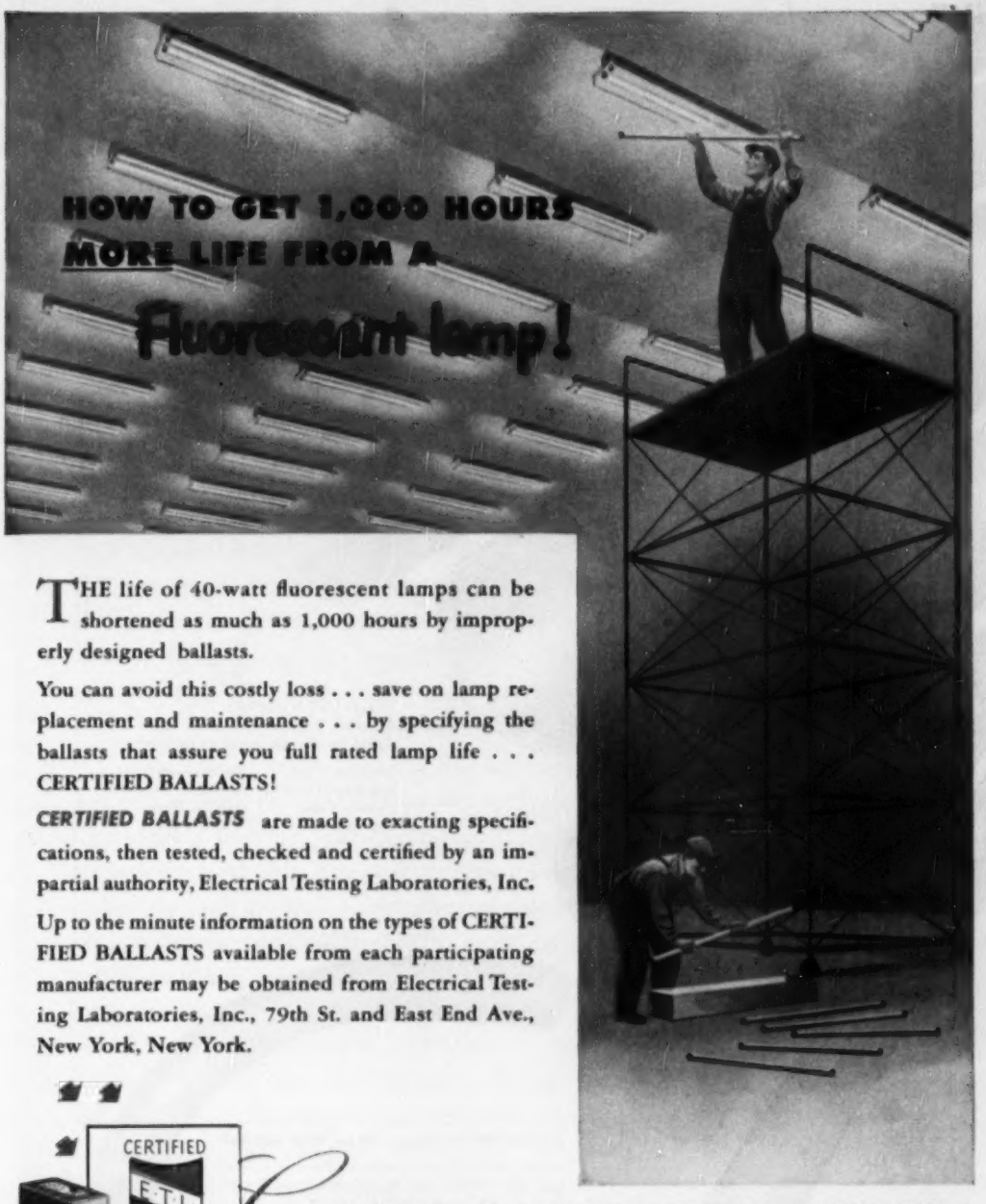
Aged for 16 weeks, it retained approximately 50% of its tensile strength, nearly 68% of its elongation. More than that, its rate of deterioration after the first few weeks was very slight, indicating exceptional stability and long life. It remained rubber-like in quality and appearance and was still suitable for further use. Compare this with ordinary vegetable oil base and heat-resistant compounds which, inside of only 3 weeks, became brittle and cracked and crumbled.

Aged for 7 days, Anhydrex XX was immersed for a week in distilled water at 158 F. (70 C.) and absorbed less than 15 mg. per square inch of exposed surface.

Aged for 7 days, it was bent around a mandrel and exposed to .03% ozone for 4 hours yet would not crack.

Compare these values with those of any other high-voltage insulation. You'll find a big difference; a difference that pays off in more economical, more efficient, and more reliable power transmission whenever Simplex-ANHYDREX XX Cables are on the job. If you would like more complete information and specification data on Anhydrex XX, simply drop us a line at the below address.

SIMPLEX WIRE AND CABLE COMPANY
79 Sidney Street, Cambridge 39, Massachusetts

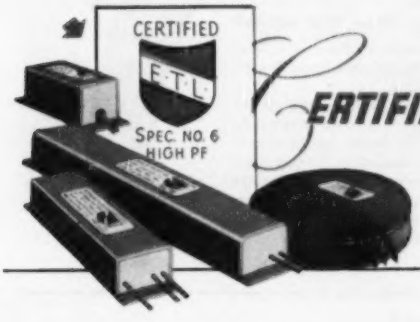


THE life of 40-watt fluorescent lamps can be shortened as much as 1,000 hours by improperly designed ballasts.

You can avoid this costly loss . . . save on lamp replacement and maintenance . . . by specifying the ballasts that assure you full rated lamp life . . . CERTIFIED BALLASTS!

CERTIFIED BALLASTS are made to exacting specifications, then tested, checked and certified by an impartial authority, Electrical Testing Laboratories, Inc.

Up to the minute information on the types of CERTIFIED BALLASTS available from each participating manufacturer may be obtained from Electrical Testing Laboratories, Inc., 79th St. and East End Ave., New York, New York.



CERTIFIED BALLAST MANUFACTURERS

Makers of Certified Ballasts for Fluorescent Lighting

2116 KEITH BLDG., CLEVELAND 15, OHIO

clean as a

ROME • EMT is available in ½", ¾", 1", 1¼", 1½" and 2" from Rome Cable warehouse stocks as follows:

Torrance, Calif.	Dallas, Texas
Los Angeles, Calif.	Salt Lake City, Utah
Denver, Colo.	Seattle, Wash.
San Francisco, Calif.	Chicago, Ill.

• ROME-EMT 90 Degree Elbows Now Available

Rome Cable now supplements its thin wall conduit line with ROME • EMT 90 degree elbows in ½" ¾", 1", 1¼", 1½" and 2"

As in the case of conduit, ROME • EMT elbows are electro-galvanized for a uniform weather-resistant exterior, while the inside has a smooth lustrous coating of clear enamel for easy pulling. Rome Cable's high standard of quality assures you of permanent protection against abrasion, moisture and corrosion. Make your next job a complete ROME • EMT installation.

shotgun barrel...

Rome • EMT

THE *SUPERIOR* ELECTRICAL METALLIC TUBING

Look through a length of ROME • EMT and see for yourself why it is the preferred thin wall conduit. Why, with its clean, mirror-smooth enamel interior finish, it is easier to fish . . . speeds up pulling wires. There are *absolutely no burrs* to slow up work or damage expensive cable. You will find it "clean as a shot gun barrel."

The electro-galvanized exterior has an even, unbroken zinc coating for maximum resistance to corrosion. Completely modern manufacturing facilities and skilled workmanship combine to give ROME • EMT uniformly high quality . . . accuracy of diameter and wall thickness. Yes, ROME • EMT is a quality product inside and out. Underwriters approved, it complies with all thin wall raceway standards.

Lighter, more economical, and easier to work than heavier types of raceway materials, ROME • EMT is definitely your best buy. It is stocked for immediate delivery. See your electrical wholesaler, or call your nearest Rome Cable office today.

For unexcelled cable performance:

RoZone®
RoMarine
RoPrene®
RoLene
RoFlex
RoBarn
Rome Synthinol®

Remember these names for dependable quality.

It Costs Less to Buy the Best

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PACIFIC COAST SALES OFFICES

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ONE SOURCE: VICTOR

For distribution insulators and line hardware

YES, you can rely on VICTOR *alone* for *all* your distribution insulator and line hardware requirements . . . from pintype, spool, guy strain and dead-ending insulators, to strain and angle clamps of the highest quality. And, when you standardize on VICTOR, you—

CUT DISTRIBUTION COSTS 2 WAYS

1. *Less maintenance*—because these distribution insulators are ruggedly designed and made of the best "high voltage" porcelain to give you continuous, *trouble-free* performance under *all* kinds of operating conditions.

2. *Fewer replacements*—because each distribution insulator is thoroughly inspected and rigidly tested at *every* point of manufacture. This *guarantees* you top performance on-the-job.

So, on your next distribution job, standardize on VICTOR.

Now Available—

VICTOR'S ALL-NEW CONDENSED CATALOG

Write for your copy today!

Eyes Right!

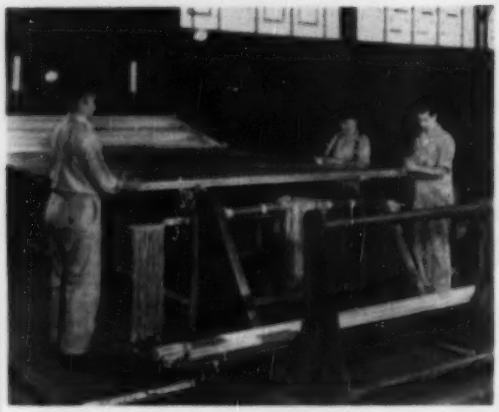
RIGHT LIGHTING

● The eyes have rigid requirements in efficient lighting. Smoot-Holman certified illumination meets those requirements with unvarying quality and performance created by superior engineering and skill. Beauty, high efficiency and dependable operation are the hallmarks of the finer lighting equipment that bears the Smoot-Holman label in institutional, commercial and industrial installations.

ILLUMINATION EQUIPMENT
SMOOT-HOLMAN
INGLEWOOD, CALIFORNIA ®
MADE IN U.S.A.

OFFICES IN [illegible] WAREHOUSE IN SAN FRANCISCO

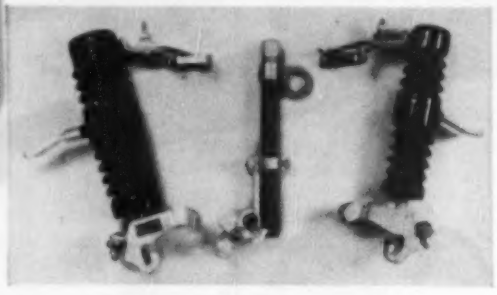
PRODUCT NEWS



Metallic Tubing Added to Line

(1) Spang-Chalfant Division, the National Supply Co., Grant Bldg., Pittsburgh, Pa.

Electrical metallic tubing has been added to the manufacturer's line and is being made in sizes from ½ to 2 in. and in standard 10-ft. lengths. Known as Central electrical metallic tubing, it has an electrogalvanized exterior finish. The interior is finished with an elastic enamel coating. This product meets requirements of the NEC and has approval of Underwriters' Laboratories.



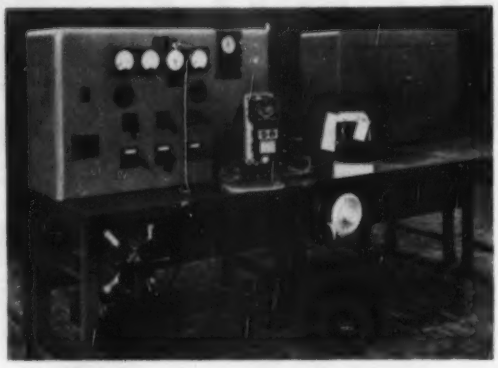
Heavy-Duty Open-Dropout Cutouts

(2) General Electric Co., Schenectedy 5, N. Y.

Two new 100-amp. open-dropout cutouts with heavy-duty interrupting ratings of 5,000 amp. are available in 5.2- and 7.8-kv. maximum ratings and supplement a line having NEMA standard interrupting rating of 2,000 amp.

The manufacturer's standard 5.2- and 7.8-kv. open-dropout cutouts already in service may be converted to heavy duty by replacing the standard fuseholders with the new interchangeable heavy-duty fuseholders. Where increased station capacity requires cutout of higher interrupting ratings, savings can be made by replacing only the fuseholder instead of the entire cutout, the manufacturer states.

The new cutouts feature close coupling of the fuseholder and insulator to reduce recoil stresses on the porcelain and a fuseholder that is sealed at the upper end to prevent power arcs and flashover. Two rubber bumpers and a coil spring prevent shock from being transmitted to the porcelain. Because the mounting bracket is cemented into the porcelain on the opposite side from the live parts, birds and animals are prevented from "bridging" the insulator and blowing fuses. A time delay of 5 or 6 cycles for contact-separation eliminates arcing at the contacts, which are silver plated.



Single-Phase Relay Test Set

(3) Arthur E. Booth Co., 4124 Beverly Blvd., Los Angeles 4, Calif.

This all-in-one single-phase relay test board will test single-phase power system relays and the single-phase elements of polyphase relays. Cabinet is approximately 4 ft. long, 30 in. high and 15 in. deep and can be seen installed in the accompanying picture. Supply, current and potential transformers are housed in the cabinet; instruments and controls are mounted on the front vertical surfaces of the board and bench.

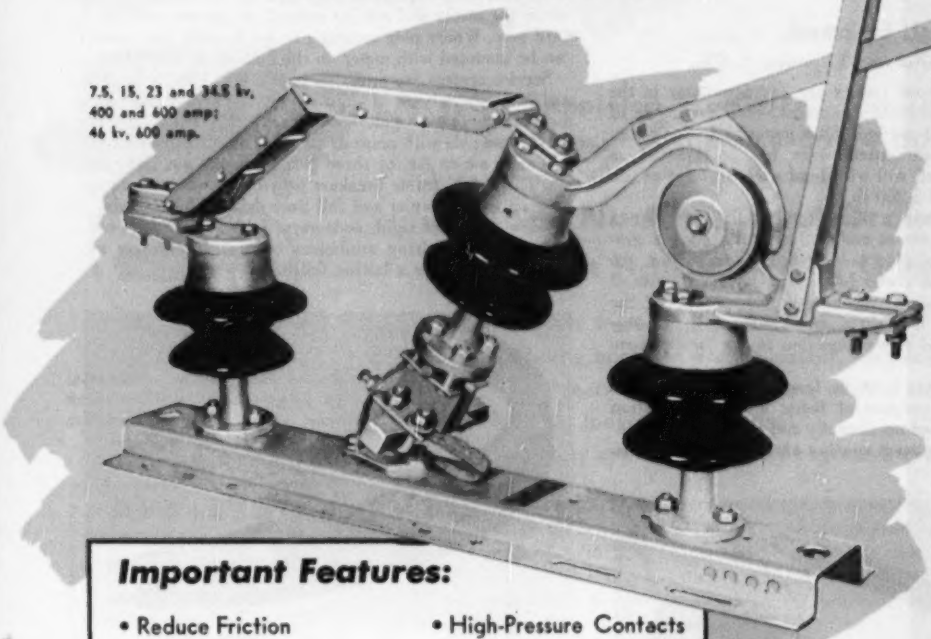
Instruments are the switchboard type, flush-mounted, with full 270° scales and with accuracies of 1%. The a-c current output circuit has ranges of 1, 5, 10, 25 and 125 amp. and is metered with an ammeter. The a-c potential output circuit is metered with a voltmeter having ranges of 1.5, 7.5, 30 and 150 volts. A phase-angle meter is provided for measuring electrical degrees between these current and potential circuits. One output circuit with a capacity of 3 amp. at 6 volts d-c is provided with switchboard-type indicating ammeter and control on the panel. This d-c source permits use of the conventional cycle-counter, portable or flush-mounted type, to indicate relay tripping time.

The board is supplied completely wired and calibrated for connection to 120-volt, 3-phase, 60-cycle supply. Unit is painted with smooth enamel finish in customer's choice of color. Delivery is in 90 days, according to the announcement.

Now..Rolling-Contacts on Rocking-Insulator Switches

Type SW and SWA Outdoor Air Switches

7.5, 15, 23 and 34.5 kv, 400 and 600 amp; 46 kv, 600 amp.



OPENING

Twin discs move upward and revolve when switch opens.

CLOSING

Twin discs revolve when switch closes. Note goose-neck blade that makes lengthwise wipe contact and vertical entry.

ILLUSTRATED ABOVE:
Type SW, 15 kv, 600 amp. Type SWA is similar, two insulators per pole.

Important Features:

- Reduce Friction
- "Run" Cooler
- Assure Easier Operation
- No Contact Shunts
- Solid-Silver to Solid-Silver Inserts
- High-Pressure Contacts —80 lbs.
- All Nonferrous Above Insulators
- New Terminal Reduces Electrical Joints
- Protected Flexible Jumpers

Get All Facts . .

Call **PACIFIC ELECTRIC MFG. CORPORATION**

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KRIPPNER & POLLEY
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Other Representatives in Principal Cities

Base Spacer

Bend Spacer Bar

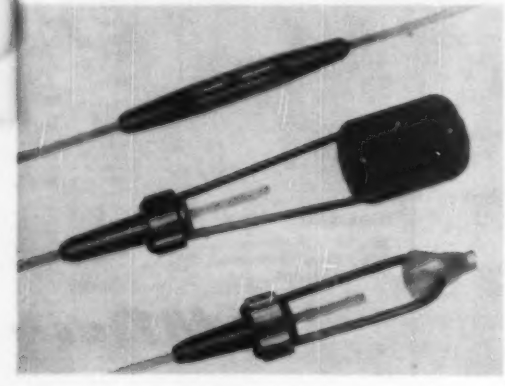
New Fiber Products Equipment

(4) Line Material Co., Milwaukee 1, Wis.

A base spacer and bend spacer bar are new items in the L-M line of fiber products equipment. Both are made of the same asphalt and asbestos fiber material as the manufacturer's intermediate spacer; are highly resistant to alkalies and acids and will withstand a vertical flat crushing test in excess of 1,200 lb.

The base spacer has a 3-in. bottom said to assure a rigid and firm foundation and maintain the desired gradient of a duct installation before concrete is poured. An integral feature is the center loop through which a tinned copper or similar wire may be run for grounding the entire installation. It is available in sizes for 2-, 3-, 4-, 4½- and 5-in. conduit and is a companion to the intermediate spacer.

The bend spacer bar is 20 in. long and 1½ in. square, serves the primary purpose of being a duct installation leveller. It may be used horizontally and vertically to maintain alignment and correct spacing around conduit bends.



New Splices and Deadends

(5) Reliable Electric Co., 3145 Carroll Ave., Chicago 12, Ill.

A new line of automatic-type splices and deadends for 5/16- and ⅜-in. steel strand messenger, static and guy wires is said to have a holding power surpassing the ultimate strength of standard steel strand, irrespective of grade. Available from stock they are identified as Strandlink and Strandvise. It is claimed that splices are made in a matter of seconds and that lashing machines pass the splice without difficulty. Tension applied with hoist or block feeds the strand through the Strandvise any desired distance. Gripping jaws are composed of several hundred case-hardened Zinolyte plated steel teeth, per set, with a protective coating. Housing on both the Strandlink and Strandvise is heat-treated aluminum alloy. Bails are type 304 stainless steel.

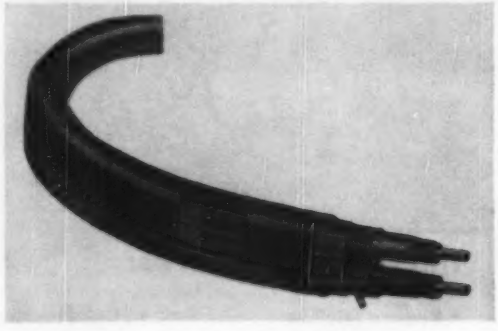
Outdoor Service Center for Rural Use

(6) Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

This outdoor service center for the farm consists of heavy-duty F & K frame circuit breakers inside a weatherproof sheet steel enclosure. It is adaptable for farmstead wiring where the meter and service control can be mounted on a yard pole. Where pole metering is not feasible, the centers can be mounted with meter on the outside of a building.

Service centers are available in 70-, 90-, 100-, 125-, 200- and 225-amp. ratings at 125-250 volts a-c or d-c; 250 volts a-c, three wire, two pole with neutral; 250 volts a-c, four wire, three pole with neutral; straight two or three pole for 250 volts a-c or d-c, or three pole 230 volts a-c, 575 volts a-c. The F & K frame breakers provide instantaneous tripping on short circuits and full time delay on overloads.

Cabinets are of rigid, code-gage, folded sheet steel construction. Bonderizing minimizes corrosion, improves appearance and gives a lasting finish.



Improved Canvas-Back Loomwire

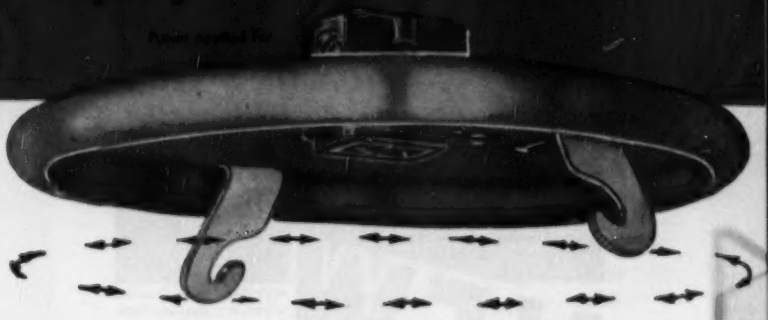
(7) National Electric Products Corp., Chamber of Commerce Bldg., Pittsburgh 19, Pa.

Improvements in design of its canvas-back loomwire have been announced by this manufacturer. The No. 14 and No. 12 cable, with type T or type R conductor insulation now have a "frosty finish," claimed to feel cool, smooth and hard, not to stick to hands or flake or rub off. This finish is said to allow the cable to be handled or stored in warm locations without its becoming tacky and to improve ease of installation.

Stripping is improved by insertion of a paper dam completely around the conductor assembly under the sheath. This dam or barrier adheres to the sheath when stripped and assures the conductor assembly's remaining clean at all times. Conductor markings are always sharp and distinct. Underwriters' approved.

AT LAST! A Really SAFE Fluorescent Fixture Hanger

Prevents Injury to Personnel!



Should screws vibrate or rust through, fixture will stay up—supported by exclusive safety clips (arrow) which rest on ears of outlet box.

APPLETON
SAFETY SWIVEL HANGERS

Designed to assure adequate support for heavy duty lighting fixtures used in industrial installations. Entire weight of suspended unit is carried by a fixture stud, greatly increasing load capacity of hanger unit.

Appleton Type "SFH" Fixture Hanger
For Use with Appleton 4-O or 4-OD Outlet Boxes

Costs No More Than Ordinary Fixture Hangers—*Yet Gives You . . .*

- Double Protection Against Falling!
- Sliding hooks to permit instant, permanent alignment!
- Easy installation—Just loosen screws, mount, tighten!
- Better looking installation!
- Quality approved by safety engineers everywhere!

Pear-shaped screw holes permit speedy mounting to outlet box without removing outlet box screws. A 10-degree turn seats hanger in position with hanger clips over outlet box ears. Complete with two five-foot chains, hooks and cord clips—or hanger may be purchased separately. Two-wire receptacle or three-wire twist-lock receptacle.

SOLD THROUGH ELECTRICAL WHOLESALERS

APPLETON ELECTRIC COMPANY
1709 WELLINGTON AVENUE · CHICAGO 13, ILLINOIS
LOS ANGELES 12, 100 N. Santa Fe Ave.
SEATTLE 9, 115 Ray Street
SAN FRANCISCO 1, 655 Minna Street
DENVER 2, 1921 Blake Street

APPLETON

CONDUIT FITTINGS • LIGHTING EQUIPMENT • OUTLET AND SWITCH BOXES • EXPLOSION-PROOF FITTINGS • REELITES

RATING: Pull Chain—250W 250V; Keyless—660W 250V. Convenience Outlet 15A-125V or 10A-250V.

NEW

PAULDING WALL BRACKET FIXTURE . . WITH CONVENIENCE OUTLET

PAULDING NO. 1795 MOLDED PORCELAIN WALL BRACKET UNIT WITH CONVENIENCE OUTLET.

Completely wired and equipped with opaque glass shade and cadmium plated mounting strap for 3½" and 4" outlet box or Goon 3 Box. Base: 5½" x 8".

PAULDING

PORCELAIN PRODUCTS

are the best money can buy . . . regardless of price. The quality of interior parts and working mechanisms is proved by the fact that they stay working on the job long after others fail.

THE NEW PAULDING UNIT shown here meets a great and growing demand from Wholesalers, Contractors and Retailers everywhere. No. 1795 is ideal for residential, commercial or industrial installation in bathrooms, lavatories, over kitchen sinks, wash tubs, work benches, counters, tables, etc. Recommended for use wherever directed light and an extra outlet are required from the same box.

PAULDING OFFERS 4 TYPES of the fixture shown.

1795 — Pull Chain with Convenience Outlet.

1796 — Keyless with Convenience Outlet.

1797 — Pull Chain, No Outlet.

1798 — Keyless, No Outlet.

750 — Pull Chain Replacement Socket.

Quality construction throughout. Approved by Underwriters Laboratories. Sold only through recognized channels.

See the entire Paulding line of wiring devices and Kaolite fixtures.

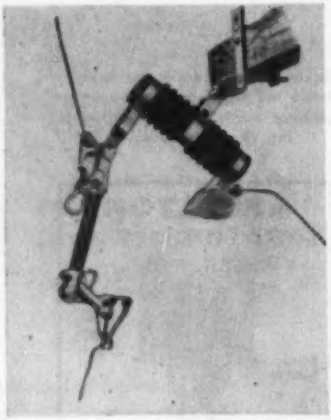
Complete catalog available on request.

UNSURPASSED QUALITY . . . AT A COMPETITIVE PRICE

JOHN I. PAULDING, INC.

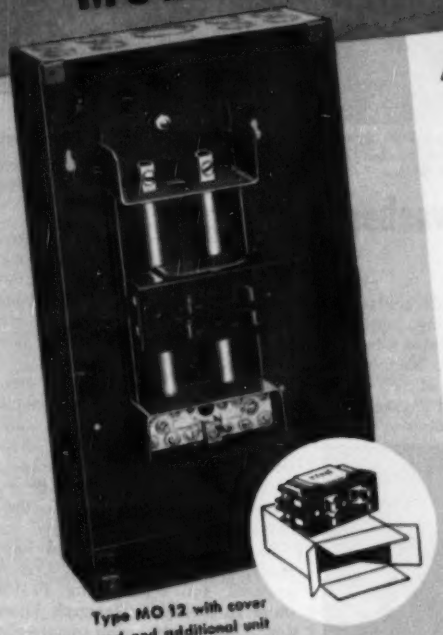
NEW BEDFORD, MASSACHUSETTS

(8) Model FT, a new front-mounted pole-setting derrick, is designed for use with trucks having front-end winches. It is made of seamless steel tubing with reinforcement where necessary. The main boom is adjustable to four positions, the highest enabling the derrick to handle poles 35 ft. long and a working load up to 1,500 lb. Also available is a new ratchet-type front support jack to take load off truck and truck springs. Batavia Metal Products Corp., 750 Liberty St., Batavia, N.Y.



(9) This improved type KM kick-out cutout is recommended by the manufacturer, A. B. Chance Co., Centralia, Mo., for distribution systems where interrupting capacity up to 2,000 amp. is required. It is designed to show at a glance whether it has been opened as a disconnect or by a protective operation. If the fuse tube is hanging from the lower contact housing, the cutout has been operated manually; if it is hanging from the upper housing, the fuse link has been blown. All the moving parts at the top and bottom are shielded from ice accumulations

NOW . . . "plug-in" type MULTI-BREAKER LOAD CENTERS



Type MO 12 with cover removed and additional unit ready for installation.

ADD CIRCUITS EASILY, QUICKLY

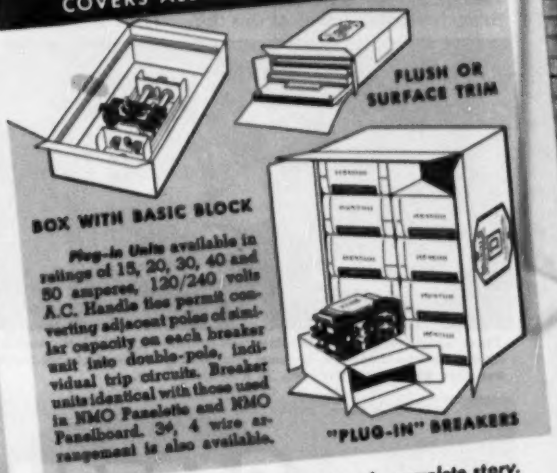
Start with 4 . . . Add More

TYPE MO 12 consists of box with bus structure and one 4-circuit "plug-in" unit in place. One or two additional 2 or 4 circuit units can be plugged on the bus structure —giving 6, 8, 10 or 12 circuits as required.

TYPE MO 20 is similar to type MO 12 but it provides space for as many as four additional 2 or 4 circuit "plug-in" units—giving 6, 8, 10, 12, 14, 16, 18 or 20 circuits as required.

SMALL STOCK OF COMPONENT PARTS

COVERS ALL JOB REQUIREMENTS



Plug-in Units available in ratings of 15, 20, 30, 40 and 50 amperes, 120/240 volts A.C. Handle ties permit converting adjacent poles of similar capacity on each breaker unit into double-pole, individual trip circuits. Breaker units identical with those used in NMO Panelette and NMO Panelboard. 3ϕ, 4 wire arrangement is also available.

Write for Bulletin SA 590 . . . *it gives the complete story.*

Address Square D Company, 4335 Valley Blvd., Los Angeles 32, Calif.

Cutless

THERMAL-MAGNETIC BREAKER UNITS GIVE 2-WAY PROTECTION

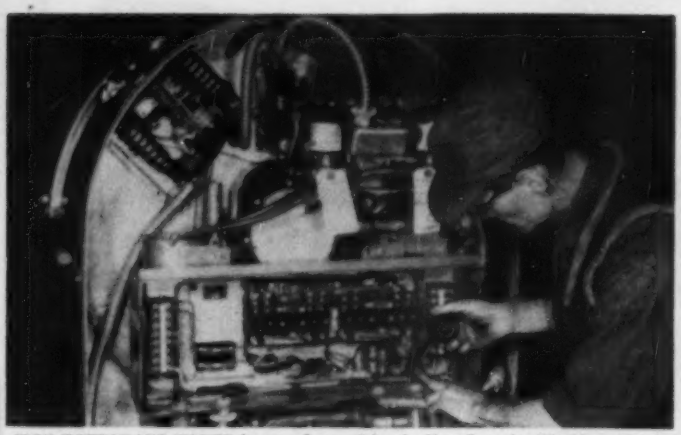
Thermal element responds to heating effects of both load current and surrounding atmosphere. *Total temperature* is limited to a safe value. **Magnetic** element responds instantly to heavy overloads or shorts. Damage is minimized.

***Both* ELEMENTS ARE NEEDED FOR *Complete* PROTECTION!**

SQUARE D COMPANY

DETROIT · MILWAUKEE · LOS ANGELES

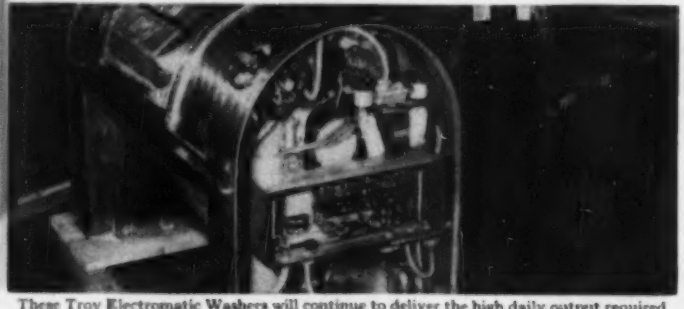
SQUARE D COMPANY CANADA LTD., TORONTO • SQUARE D de MEXICO, S.A., MEXICO CITY, D.F.



TROY ELECTROMATIC WASHER is manufactured by the Troy Laundry Machinery Division of American Machine and Metals, Inc. Picture shows how the reverse mechanism panel is harnessed and spliced with neat, stretchy "SCOTCH" No. 33 Electrical Tape.

Moisture-Proof splices for Troy washers with new plastic tape

COMMERCIAL LAUNDRY EQUIPMENT must give continuous, sure service in steamy surroundings. That's why splices and harnesses in the Troy Washer are made with "SCOTCH" No. 33 Plastic Tape. Smooth plastic backing of this thin tape resists moisture, oils, acids and alkalies . . . assures long, trouble-free service . . . gives neater jobs. Write Dept. EP-650, Minnesota Mining & Mfg. Co., St. Paul 6, Minn., for complete information. There will be no obligation.



These Troy Electromatic Washers will continue to deliver the high daily output required by commercial laundries, because vital wiring of the electrical controls is sealed against moisture with "SCOTCH" No. 33 Electrical Tape.

Made in U. S. A. by **MINNESOTA MINING & MFG. CO.,** St. Paul 6, Minn.

also makers of other "Scotch" Brand Pressure-Sensitive Tapes, "Scotch" Sound Recording Tape, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-Slip Surfacing, "3M" Abrasives, "3M" Adhesives.

General Export: DUREX ABRASIVES CORP., New Rochelle, N. Y.
In Canada: CANADIAN DUREX ABRASIVES LTD., Brantford, Ontario

Pole Tester Offered to Public

(10) Washington State College Research Foundation, Pullman, Wash.

A torque screw pole tester, invented by Professor Homer J. Dana, director of the engineering experiment station of Washington State College's Division of Industrial Research, has been perfected at the college and is being offered to the public.

The tester is used to show strength and condition of power and telephone poles in service. It measures and records the force required to drive a screw into the pole just below the ground line, fiber strength of the wood being closely proportional to the resistance to turning.

The device was developed for the Washington Water Power Co.; was patented and donated by Professor Dana to the WSC Research Foundation. The accompanying picture shows Professor Dana, left, Brendan Byrne, staff engineer, right.

(11) RELAY CASES—Semi-flush cases for type SG and MG-6 relays available from Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa., are designed to harmonize with the Flexitest case used for mounting protective relays and give uniform panel appearance in mounting auxiliary relays.

(12) PANELETTE—A "Plug-In" multi-breaker Panelette as an "off the shelf" companion to the NMO panelboard has been announced by Square D Co., 6060 Rivard St., Detroit, Mich. It meets most a-c lighting and appliance circuit switching and protection requirements, according to the manufacturer. Standardized components are stocked by all the manufacturer's distributors. Construction features include 12-in. wide by 4½-in. deep box designed for easy wiring, door with locks, lugs only from 4 to 28 circuits, circuit breaker mains from 4 to 20 circuits. Available for single-phase, 3-wire or 3-phase, 4-wire systems.

(13) THERMOSTAT—A portable thermostat for use with portable electric heaters is being marketed by Electric Controls Inc., Swan Island, Portland 18, Ore.

STANDARD ENGINEER'S REPORT

RPM DELO

TEST DATA

LUBRICANT *RPM Delo Supercharged Lubricating Oil*

UNIT *Caterpillar Diesel-D17000-V8 Cyl.*

CONDITIONS *Cont. High load-actual field oper.*

FUEL *Commercially available Diesel Fuel*

TEST PERIOD *4 months*

FIRM *Homer Jones Ranch, Chandler, Ariz.*

Stopped all ring sticking where ordinary oil failed!

AFTER ONLY 625 HOURS operation on an ordinary heavy-duty type oil, an engine pulling 90% of full load rating had 39 stuck rings—only 9 of its 48 rings were free and several were broken. There were heavy lacquer and carbon deposits in ring grooves and on piston-skirts, as indicated by this unretouched photograph of one of the pistons. Besides stuck rings, note clogged oil-return holes and oil rings.

OPERATED 1582 HOURS — more than twice as long — on RPM DELO Supercharged-2 Lubricating Oil, the same engine, running under the same load and fuel conditions, stayed efficient and clean, as this unretouched photograph shows. At the end of test all 48 rings were free, with no piston-skirt deposits. Ring-groove deposits were 50% less. Note how RPM DELO Supercharged-2 kept oil-return holes open.

REMARKS: RPM DELO Supercharged-2 Lubricating Oil is one of four grades in the RPM DELO Oil line. It solves operating problems in both Diesel and gasoline engines, especially where load conditions are extreme.

Its detergent prevents carbon and lacquer deposits on all parts, even with high sulphur-content fuels.

RPM DELO Supercharged-2 Oil sticks on hot and cold surfaces — reduces wear under the heaviest loads. (Cylinder-wear averaged only 0.0014 inches per 1000 hours with RPM DELO Supercharged-2, while with the ordinary oil it was 0.0043 inches — three times greater.) RPM DELO Supercharged-2 Lubricating Oil also contains special compounds that resist oxidation and sludging, prevent bearing corrosion and internal rusting, and stop foaming.

STANDARD TECHNICAL SERVICE checked and reported this test. If you have a lubrication or fuel problem your Standard Fuel and Lubricant Engineer or Representative will give you expert help; or write Standard of California, 225 Bush Street, San Francisco 20.

STANDARD OIL COMPANY OF CALIFORNIA

to the problem of
HIGH INSULATION PERFORMANCE
at LOW cost:

IRVINGTON
Style OW
VARNISHED
FIBERGLAS*

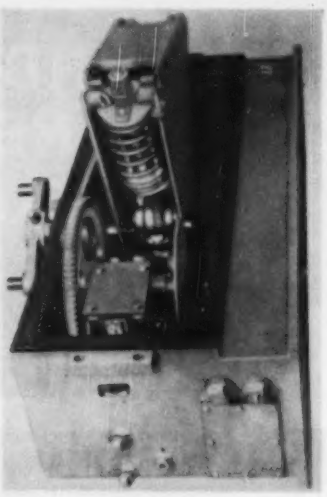
Look to Irvington
for Insulation Leadership

*T.M. Reg. Owens-Corning Fiberglas Corp.

Look to Irvington for the right combination to boost performance, improve quality, cut cost...of *your* products! Latest in Irvington's line of leadership is style OW Varnished Fiberglas Class B insulation, which has *proved* its value in core wrappings, field coils, punching, similar tough spots.

Irvington Style OW Varnished Fiberglas utilizes a new weaving principle that permits the glass fabrics to carry more insulating varnish. Black or yellow, 36" wide, .007" to .012" thick, 25 or 50 yds. long, this new insulation may provide the answer to your design problem. Write today for test reports, further details, samples.

IRVINGTON
VARNISH and INSULATOR COMPANY
Irvington 11, New Jersey
Represented in the Western States by
C. D. La Moree, Los Angeles, Berkeley, Seattle; Electric Motor Supply Co., Denver



Transfer Mechanism

(14) G&W Electric Specialty Co., 7780 Dante Ave., Chicago 19, Ill.

This model E6 selective automatic transfer mechanism is for use with the company's load break oil switches—either a double throw or two single-throw switches supplying one load from either of two feeders. With one feeder selected as "preferred" and the other as "emergency," the mechanism will automatically transfer the load from the preferred to the emergency upon failure of the former and back to preferred when that feeder is re-energized.

In addition the mechanism provides for operator selection from a remote location of the preferred and emergency feeders. This feature allows the operator to transfer load at will between the two feeders to balance them during periods of peak demand or to isolate one feeder for repairs or routine maintenance.

The mechanism is enclosed in a sealed housing. A motor, two tripping solenoids, two actuating springs and other mechanical components are compactly arranged beneath the domed cover. Relays and contacts are enclosed in the front compartment. The housing is mounted on the supporting frame of type RA switches in 5,000, 7,500 and 15,000-volt ratings.

(15) GROUND CLAMP—An improved type ground clamp that fits either water pipe or ground rod has been developed by the H. B. Sherman Mfg. Co., Battle Creek, Mich. This GF13-B clamp resembles the conventional type but has a specially shaped bottom section that may be installed either side up, thus adapting it to a wide range of pipe and rod diameters. Ground connections may be made to pipe ranging from ¾ to 1 in. diameter and rods from ⅝ to 1 in. diameter.

Because IT *MUST* BE RIGHT

You can count on

TRIANGLE

You can see for yourself that it takes massive machines to turn out lead covered and high voltage cables to meet today's rigid specifications. But machines alone cannot do the job: behind them must be men of many years' experience in making cable — in making it *right*.

At Triangle's efficient New Brunswick plant you will find modern machines manned by true craftsmen, checked by rigorous inspection, backed by unceasing development and research. To you, this means the finest in parkway...power...varnished cambric ...lead covered cables that can be constructed — today's top value in wire and cable.

Whether your needs are for standard cables built to I.P.C.E.A. recommendations, or for special cables tailor made to your own specifications, you will find Triangle engineers glad to consult with you.

TYPE RLJFJ

PARKWAY CABLE

TYPE VML

LEAD COVERED CABLE

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VARNISHED CAMBRIC CABLE

Protection Plus—This huge press produces a smooth, uniform sheath of virgin lead for utmost cable protection.

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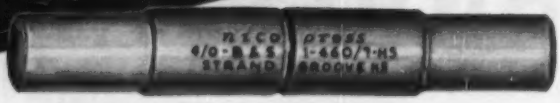

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The editors of Electrical West will be glad to answer questions on engineering techniques; in the lighting and wiring fields; on the electrical code; on merchandising and appliance markets and other phases of the electrical industry in the eleven Western states

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OHIO MOTOR BRUSHES offer you the maximum in efficient commutation. They are "precision-made" and are processed by us from raw materials through to the finished product. For complete motor brush service look to "OHIO" from all standpoints, engineering, new development, special requirements and dependable manufacturing.

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THE OHIO CARBON COMPANY
12508 BEREA ROAD • CLEVELAND 11, OHIO

Water Heater Control

(16) Sangamo Electric Co., Springfield, Ill.

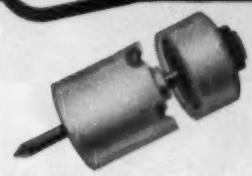
This synchronous motor-driven time switch for electric water heater control was designed for easy installation at minimum cost, according to the manufacturer. Designated as type MN, the new switch has a nipple and collar for mounting on a ¾-in. knockout on meter service cabinets. Eighteen-inch leads are furnished with lug connectors on the line side. On and off operations are performed on a repetitive schedule only, with an interval of 1¼ hours between successive operations. Lowest priced of the manufacturer's standard M line, this switch is equipped with a hysteresis synchronous-type, silicone-lubricated timing motor. It is provided with one on and one off lever; additional levers can be attached.

(17) INSULATING TUBING—Improved braid and superior resins are claimed to give Irv-O-Flex, a new electrical insulating tubing increased flexibility throughout a greatly extended life. Irvington Varnish & Insulator Co., 6 Argyle Terrace, Irvington, N. J.

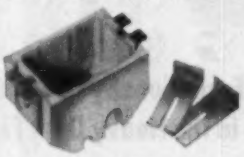
(18) DEAD-END CLAMP—An improved Pinco L-8038 clamp has an extra long J-bolt keeper, which doubles the gripping area on the conductor. This keeper now contacts all wires in the long-lay conductors and holds them securely without damage to conductor wires. Cable seat accommodates conductors from .16 in. to .375 in. in diameter; ultimate strength of clamp is 8,000 lb. Porcelain Insulator Corp., Lima, N. Y.

(19) WIREWAY—A 4x6-flangeless wireway, equipped with screw-type cover for convenience in use and neatness of appearance, has been added to the line of Keystone Mfg. Co., 23328 Sherwood Ave., Center Line, Mich. It is approved by Underwriters' and comes in standard lengths of 1, 2, 3, 4 and 5 ft.

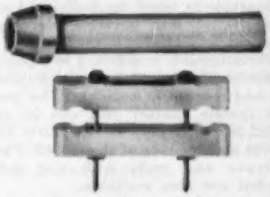
...and for LOW VOLTAGE TOO! call Porcelain Products



Dense, good looking, positive gripping ALLIGATOR Nail Knobs are preferred by electricians insisting on workman-like installations to build good-will and repeat business.



Outlet boxes with Adjustable Metal Mounting lugs and set of Hangers are nationally famous for durability, ease of installation and safety features.



A complete size range of tubes as well as 2 and 3 wire cleats are available for immediate delivery. Made precisely to give long and satisfactory performance.

Both round and oval type split for entry insulators as well as telephone insulators are available for immediate delivery.

SEND YOUR INQUIRY TO

Porcelain Products, Inc.
FINDLAY, OHIO

TRIPLOC Plugs and Receptacles

2, 3, 4, 5, 6, 8 pole interchangeable and reversible contact units.

An Exceptionally Versatile Line in the Heavy Duty Field

An exceptionally versatile line, unequalled in the heavy duty field, with a virtually unlimited number of assembly combinations to meet the individual requirements of any portable electrical equipment.

Interchangeable contacts, 1 to 8 poles, can be assembled in standard plug shells and receptacle housings. The protected female contact unit can be assembled in either plug or receptacle for safety in the line side of the circuit. Fusible types and units with one pole grounded are also available.

Automatic bayonet lock with either manual or combination manual and automatic release protects equipment and wiring. Wide range of pressed steel plug shells, receptacles, and cord connectors available in the complete Triploc line, including cast metal housings threaded for watertight gasket seal. Ratings up to 20 amperes, 250 volts DC, 460 AC. Consult your Pylet Catalog 1100, Bul. 1140-1, for complete listings.

CONDUIT FITTINGS • FLOODLIGHTS

THE PYLE-NATIONAL COMPANY

1334 N. KOSTNER AVE., CHICAGO 51, ILLINOIS
Pacific Coast Sales Office
35 Beale Street, San Francisco 6, Calif.

BULLETINS ETC.

(20) HANGERS — An 80-page catalog of disconnecting and lowering hangers and accessories has been prepared by Thompson Electric Co., Cleveland 14, Ohio. Some of the accessories are new developments to facilitate cleaning, maintenance and relamping of high-bay lighting fixtures.

(21) COUNTING EQUIPMENT—Bulletin PA 506 from Photoswitch Inc., 77 Broadway, Cambridge 42, Mass., describes a new photoelectric counter set, P2C, and other counter combinations.

(22) EVALUATOR—A watt-hour meter evaluator is contained in bulletin GEA-5448, "Time to Retire Old Watt-Hour Meters?" prepared by General Electric Co., Schenectady 5, N. Y. Comparison of cost of retiring and cost of keeping in service as determined by the evaluator gives an answer to the question of when it is economic to retire a group of meters. Resembling a circular slide rule, the evaluator has scales for settings to include such factors as cost of new meters, age of old meters, and excess annual cost of old meters over new meters.

(23) TRANSFORMERS — A revised catalog SD 179 covering step down transformers and voltage and frequency compensating transformers has been issued by Acme Electric Corp., Cuba, N. Y.

(24) LIGHTING—New catalog sheets covering the Plexoline system and a few of the Vis-Aid items have been issued by Day-Brite Lighting Inc., 5411 Bulwer Ave., St. Louis 7, Mo.

(25) D-C MOTORS—Reliance Electric & Engineering Co., 1088 Ivanhoe Road, Cleveland 10, Ohio, has issued a 12-page bulletin of d-c motors from ¾ to 1,000 hp. Design, construction, selection and ordering information is featured, together with frame dimensions, for type T heavy-duty, constant- and adjustable-speed motors.

(26) CLOCK MOVEMENTS—A 4-page catalog on its line of electric clock movements is being distributed by the Haydon Mfg. Co., Inc., Torrington, Conn. The movements are designed for use in advertising, household, novelty and commercial clocks.

(27) TERMINALS—An industrial wall chart giving information for selection of solderless terminal types is available from Aircraft-Marine Products Inc., 1655 4th St., Harrisburg, Pa.

(28) WELDER—A data sheet on the 200-amp. Fleetwelder is available from Lincoln Electric Co., Cleveland 1, Ohio.

(29) THERMOSETTING PLASTIC—Hysol 6000, a new material for handling corrosive chemicals and for electrical insulation, is described in a bulletin from Houghton Laboratories, Olean, N. Y. Available in rod, tube and sheet form in a variety of sizes, it may be punched or machined to close tolerances by conventional metal working machinery, the manufacturer states. It also may be cast into special shapes and components.

(30) POWER SUPPLIES—The new Varicell d-c power supplies are described in literature from Superior Electric Co., Hannon Ave., Bristol, Conn.

(31) D-C MOTORS — Publication 8.39-200 from Electric Products Co., 1725 Clarkstone Road, Cleveland 12, Ohio, covers the manufacturer's d-c motors.

(32) TRANSFORMERS—Design and construction features of Allis-Chalmers power and distribution transformers are described in a new 16-page bulletin. Also covered are the three types of load-ratio-control mechanisms available on the manufacturer's power transformers, depending on the voltage, kva. capacity and other circuit conditions. The bulletin discusses step regulators, pole-type regulators, unit substations of all types and instrument transformers. Available from the manufacturer, 939 S. 70th St., Milwaukee, Wis.

(33) RELAYS—Catalog 5-H from Guardian Electric Mfg. Co., 1621 W. Walnut St., Chicago 12, Ill., covers the company's line of hermetically sealed relays.

(34) RADIO, TV PRODUCTS — More than 5,000 radio and television products and service aids are listed in catalog G-C 154 from General Cement Mfg. Co., Rockford, Ill.

(35) LIGHTNING ARRESTERS — Thorex, valve-type lightning arresters are the subject of the O-B Hi-Tension News for July. Publication 869-H, also describing these arresters, is available from Ohio Brass Co., Mansfield, Ohio.

(36) TOOLS — Portable electric tools are treated in catalog 50A from Portable Electric Tools Inc., 320 W. 83rd St., Chicago 20, Ill.

(37) WIRE — Information on Formex and Deltabeston magnet wires is available in a 32-page booklet available from the Construction Materials Department, General Electric Co., Bridgeport 2, Conn.

Fill in the postcards on page 49

To get more information on new products and to order catalogs or bulletins mentioned in this section, fill in and mail the bottom postcard on page 49. Electrical West Reader Service has been expanded to include information on any department in the magazine. Use the second card on page 49 to ask questions or make suggestions.

88,000 HOURS

of trouble-free turbine lubrication

with SHELL TURBO OIL

And at last inspection the oil was still in "like new" condition... reports a well-known power company

TYPICAL APPLICATIONS
Where Shell Turbo Oils Can Save on Long Term Lubrication Costs

STEAM TURBINES—Direct connected, geared, pressure circulation, ring oiled

HYDRAULIC TURBINES—Vertical, horizontal. In governor systems, thrust and guide bearings.

HYDRAULIC SYSTEMS—In machine tools; hydraulic presses and other oil-hydraulic power equipment.

BEARINGS—Plain and anti friction—where severe conditions or other factors point toward use of oxidation resistant oil.

Also recommended for extra heavy duty air compressor lubrication

THE ABOVE is not just an isolated case. Other power companies, shipping companies, operators of all kinds of turbines testify to amazingly long, trouble-free lubrication from Shell Turbo Oil. And to significant savings in operating costs.

Shell was first to see the need for a *completely* fortified turbine lubricant . . . first to develop an oil with the *extra* properties it must have to give such service . . .

Non-Sludging: In service, that means piping, coolers, reservoirs stay clean.

Rust-Preventing: Governors are fully protected, oil systems stay free of deposits.

Non-Foaming: To maintain sensitive governor operation . . . to eliminate all the troubles that excessive foaming can cause.

No matter what type of turbine you operate . . . steam or hydro, stationary or marine, in power generation or mechanical drive . . . you can count on long, trouble-free lubrication with Shell Turbo Oil. *Money-saving lubrication.*

SHELL

ELECTRA'S HUSBAND

HOW DO YOU CATCH A COMMUNIST?

"HOW do you catch a Communist?" Electra asked one evening recently when we had a guest from Washington at dinner. "And what do you do with him?" she added as an afterthought.

"You'll have to be more specific," our guest said. "They are harder to catch than rats and when you find one, there isn't much of anything you can do about it."

"Take the power companies as an example," she explained. "If I was responsible for operating one of them I wouldn't want any Communists on my pay roll. The same thing ought to apply to the telephone company or for that matter to any reputable organization. But the thing I really would fear is the possibility of sabotage from some strategically placed Red whose loyalty is untested and whose presence isn't even suspected."

"Well it's my guess that every utility or similar organization engaged in providing a vital public service already knows whether it has any people of doubtful loyalty on its pay roll," our guest continued. "If it does not know, it is possible to have its entire organization screened. There are agencies that have fairly complete records of Communists and their sympathizers. And I suppose that if a company knew that it had such people working for it, the management could see that they were stuck away in some spot where they were impotent."

"But suppose I'm an employer and I want to get rid of a Communist," I interrupted. "Or suppose a Red sympathizer comes along and applies for a job. Can I refuse to hire him even though I have a union contract and he might be a member?"

"Yes, definitely," the man from Washington answered. "Under federal and most state laws, the only hiring restriction is that you cannot discriminate because of union activity or membership."

"Could I fire a man because he is a Communist?"

"Legally, yes. However, if you have a union contract, it may depend upon what it says about grounds for discharge."

"Suppose the worker claims I fired him because he is active in the union and files an unfair labor practice charge with the National Labor Relations Board?" I continued.

"Then it becomes a matter of proof as to the reason you fired him," our guest said.

"Suppose like most labor contracts, mine says I can fire a worker for 'cause.' What then?

"If your contract doesn't elaborate on what acts constitute 'cause,' then the justification for your action will probably have to be decided under the grievance machinery of your contract," our guest explained.

"Will the type of production I'm in make a difference?"

"Probably," he answered. "An arbitrator might rule you were justified in firing a suspected Communist in a war plant, but not in a business or activity wholly unrelated to war."

"Can I make Communism a basis for discharge in the union contract?" I asked.

"You surely can, if the union is willing," he replied. "I remember a clause from one contract which says in effect that the company shall be permitted to discharge any employee who, regardless of union affiliations, is proved to be affiliated or sympathetic with any Nazi, Fascist or Communist organization."

"Can I require my employees to sign a non-Communist affidavit or lose their jobs?"

"Perhaps you can if you stick close to what the Taft-Hartley law requires of union officials," he said.

"Have any unions agreed to non-Communist affidavits?" Electra asked our guest.

"Yes, the CIO Utility Workers Union," he answered.

"Where?" she asked. "You didn't tell me about it," she said, turning to me.

"At Consolidated Edison in New York," I said hastily. "The union agreed that the company could refuse to employ any person who did not sign an affidavit stating he or she was not a member of a Communist or other subversive group."

"How can I find out if a worker is a Communist?"

"That may be impossible, unless he has openly admitted it. However, many persons have been named as Communists before Congressional committees. You might rely on that information."

"What about those who simply support Communism?" I asked. "How do you identify them?"

"A good way is by the organizations they join," he said. "In connection with the federal government's loyalty program, the attorney general has put out several lists of about 100 organizations considered to be Communist or Communist inspired. They are available from the Information Division of Civil Service Commission."

"Can I refuse to bargain with a union whose officers have not signed Taft-Hartley non-Communist affidavits?" I asked.

"No, the U.S. Court of Appeals in Washington, D.C., recently said in the West Texas Utilities case that you can't," he answered. "This reversed the policy of NLRB that you didn't have to bargain with a non-complying union."

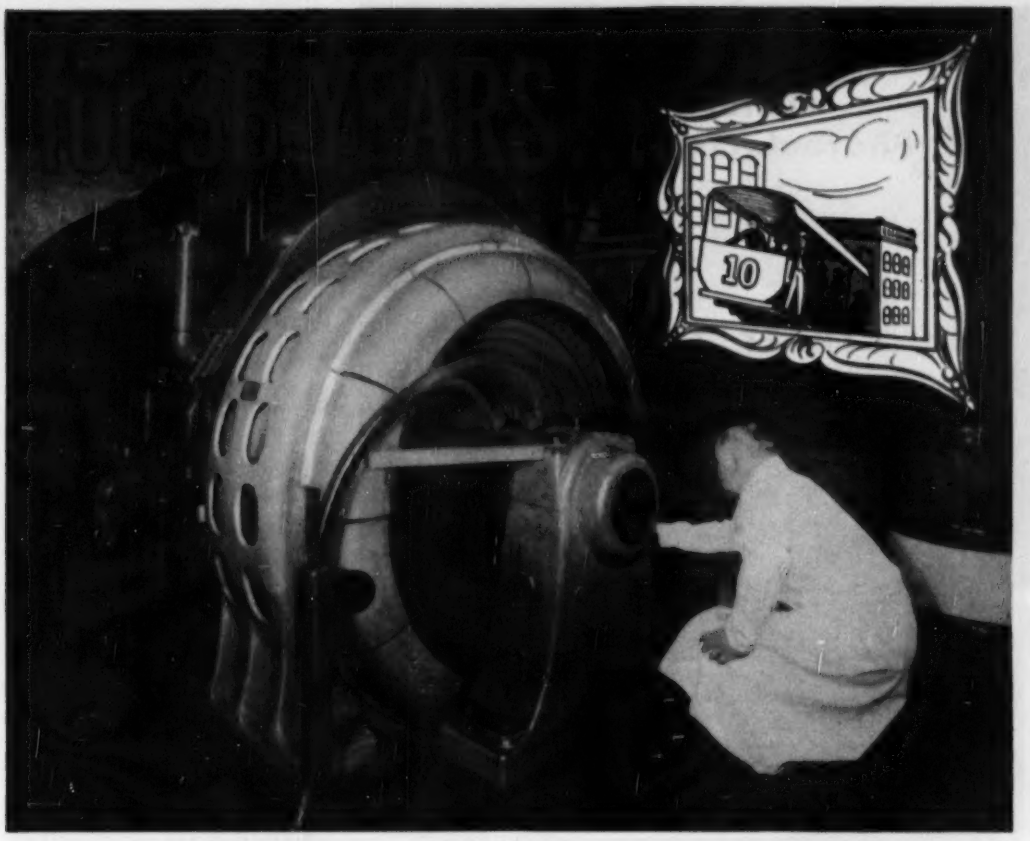
"What does Taft-Hartley say about firing Communists?" I asked at this point.

"Nothing."

"Besides a possible unfair labor practice charge, what risk would I incur by firing a suspected Communist?" I asked.

"Well, if you have a labor contract you might be sued for violation," the man from Washington said. "Or, if you publicly call a worker a Communist, you might be sued for slander. Be sure you are on sound ground before you make such a charge. Some courts have held that calling a person a Communist, when he isn't, is libelous."

"Show me a suspected Communist," Electra concluded. "I'll take a chance on a libel suit." And from the look in her eye and the set of her jaw, I think she would.



Two Allis-Chalmers Motors Have Powered San Francisco Cable Cars Without A Failure!

SINCE 1914, the colorful cable cars of San Francisco have operated without a single interruption of service. Back of this remarkable record is the performance of two, 300 hp Allis-Chalmers motors which have driven the power cables for 19 hours a day, seven days a week for every one of those 36 years!

No Trouble — Only Routine Maintenance

Mr. DeMoor, General Manager of the California Street Cable Railroad, says, "We've had absolutely no trouble with these motors. They've been given only our routine maintenance during off-schedule hours. I'm convinced there's nothing like Allis-Chalmers motors!"

Engineered for Long-Life Duty

Economical, long-life performance is typical of Allis-Chalmers motors. Sound engineering and manufacturing integrity makes them trouble-free and reliable. Your nearest A-C Sales Office or Authorized Dealer can give you full details on motors with controls to match. For information call one of them today. A-3115

ALLIS-CHALMERS, 939A SO. 70 ST.
MILWAUKEE, WIS.

ALLIS-CHALMERS

Sold . . .
Applied . . .
Serviced . . .

by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.

MOTORS — ½ to 25,000 hp and up. All types.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

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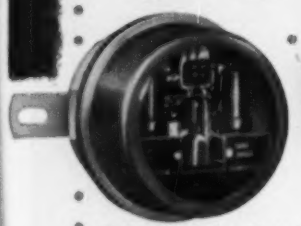

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LETTERS TO THE EDITOR

To The Editor:

In reading the July 1950 issue of ELECTRICAL WEST, I was amazed to find on page 98 that somebody had appropriated our J. W. Belanger and comfortably installed him as president of the Central Arizona Light and Power Co. of Phoenix and, in exchange, we got Mr. Henry B. Sargent to function as the assistant manager of the Apparatus Department of the General Electric Co.

That takes a bit of doing!

Very truly yours,
A. Martin
Manager, Oakland Works
General Electric Co.

To The Editor:

Who was the guy who said "I don't give a damn what they say about me, just so they spell my name right"? Vol. 105, No. 1 is a good number and you and your gang are to be complimented.

Sincerely,
Hance H. Cleland
San Diego Gas & Electric Co.

Editor's Note: Mr. Cleland refers to misspelling of his name on page 95 and of A. E. Holloway's name on page 94. Apologies to both.

ELECTRICAL BOOKS

PRIMARY BATTERIES, by George Wood Vinal, 336 pages, 6x9, John Wiley & Sons, $5. This specialized treatment offers a wide range of information—history, theory, materials, chemical reactions, manufacture and operating characteristics of primary batteries. New research tools such as the electron microscope, Xray spectograph, mass spectograph and the petrographic microscope have been applied to study of the crystal structures of the solid phases resulting from discharge and of gases liberated during periods of storage. Covered for the first time are several new types of special-purpose batteries. Detailed material is presented on silver oxide and chloride batteries, mercury oxide batteries, and perchloric and fluoboric acid batteries.

ELECTRICAL MACHINES, DIRECT AND ALTERNATING CURRENT, by Charles S. Siskind, 521 pages, 6x9, McGraw-Hill Book Co., $4.75. Practically all types of modern electrical power equipment, such as generators, motors, transformers, convectors, and control devices, are discussed in detail. Underlying principles are stressed but at the same time emphasis is given to their practical applications and operations. Mathematical treatment is simple and straightforward. Numerous examples are given to illustrate actual modern operating practices.

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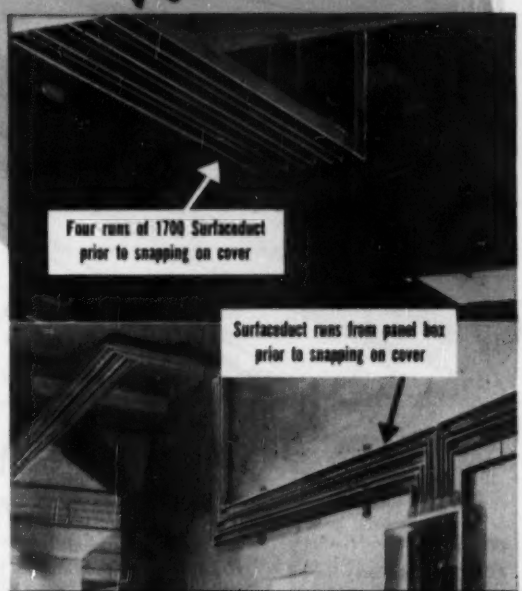

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***Send for free Catalog Bulletin** AD 5705 with complete specifications and other data on the new Benjamin "Magna-Flo" Systems.*
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AUGUST 1950 Vol. 105, No. 2

ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.

SOCIALISM IS LIKE POLIO

Dr. Christopher Daniels*

EDITOR'S NOTE: Dr. Christopher Daniels is a successful practicing English physician. Before he left England American friends urged him to warn their fellow countrymen of the dangers and pitfalls awaiting this nation if it followed Britain down the road to Socialism. In the few months he has been in America Dr. Daniels has become convinced that we are in the same confused and uncertain state of mind as were his fellows when the Fabian Society began its insidious takeover. His opinion is borne out by a recent remark of John Strachey, British Minister of War. On May 15, 1950, Mr. Strachey said, "The American administration is one of the most left-wing in the world today. It is a total misconception that the prevalent British Labor Party is left-wing and that the United States is reactionary. That picture is profoundly outdated. The United States government is far to the left of anything except Scandinavia and Britain."

We urge every reader of this magazine to read all of Dr. Daniels' straightforward and simple indictment of British Socialism. For it CAN HAPPEN HERE.

HOW to define Socialism? It is a creed, thought out, written down and urged, some 100 years ago, the product of the disturbed brains of Karl Marx and Engels. It believes in the taking over by the State of the means of production, distribution and exchange, and the control of the citizen in great detail, by the State. And I use the word State in the sense they used it, that is, as the national government and not as you use it here as the government of one of your separate states. It will avoid confusion if I make it clear here that in this talk I shall always mean the national government when I use the words "the State."

These two men were responsible for a document called the "Communist Manifesto." Many attempts have been made by the Socialists to divert attention from the fact that they base their actions on this document but you are left in no doubt that this is so if you read an edition of the Communist Manifesto published a year or two ago with an introduction by Prof. Harold J. Laski in which he gives quite incontrovertible evidence that the Socialists had followed their manifesto up to that point and intended to do so in the future.

Professor Laski was one of the architects of the Socialist Party in England; he certainly knew, if anyone knew, what was in their mind. He was not popular with his party for being so honest, nor for his remarks after the 1945 election as to what was to happen to the non-Socialists, and he was speedily suppressed. But it was too late. He had told the story and disclosed something that the Socialists, even today, try to hide, that Socialists are Socialists and follow the Communistic Manifesto.

So far as Great Britain was concerned, the Socialists' attack commenced in earnest in 1900 with the foundation of the Fabian Society by Beatrice and Sidney Webb, George Bernard Shaw, Mrs. Annie Besant, Graham Wallas and H. G. Wells; although in fairness to Wells, a man whose sympathies were with the struggling members of the population if anyone's ever were, as soon as he realized the true aims, he left them hurriedly.

The society never numbered more than 4,000 members but they were in deadly earnest, worked hard, quite clear in what they intended to do, and ruthless and Machiavellian in their methods.

I always marvel at their cynical appraisal of the intelligence of the ordinary citizen. They must regard us as very small fry in being prepared to give such a name as the Fabian Society to their group, and that they were correct in their attitude is clear because there stands before you now a man of some education, I suppose, who never once thought to find out what the word meant, nor, although his practice was amongst a highly intelligent group of Londoners, did one ever in 25 years ask if he had realized who the Fabians were or what they were doing.

The word Fabian, as I now know, is derived from the name of the Roman general, Quintus Fabius, who found that the best way to overcome his enemies was to devour them piecemeal, by lulling one section into passive obser-

*From an address before the San Francisco Electric Club, June 1950.

vation of the destruction of another. He also had a very early perception of the value of the Fifth Column. Sidney Webb brought the whole theory up to date by his phrase, "The inevitability of gradualness." They were well aware of the fact that the complexities of the modern world made it easy for them to tease the men they were fully intending to tax out of existence, into a confused and vulnerable state of mind. They knew that if they abused him and yapped at his heels for being a useless parasite, the better the man he was the more they would worry and confuse him.

They knew that the more they put it into his head that they were intending to destroy him, the shorter they would make his outlook and the more they would stimulate him, from motives of self-preservation, to refrain from correcting the very evils they so strongly criticized.

They were not, you note, at all anxious to have the evils corrected; they were anxious to bring about his downfall so that they could, by marshaling another section of the country to vote for them, bring both under their absolute domination.

How England Was Socialized

Their methods are now well known.

Firstly, they avoided like the plague any mention of Socialism as it is understood today. Almost any other word or phrase was dragged in to describe their activities. Sidney Webb knew, like Lenin, that no nation in its senses would adopt Socialism or Communism voluntarily if it understood its full implications.

Lenin believed in bloody revolution; Sidney Webb believed in the policy of confusion and that sinister phrase, "The inevitability of gradualness." "Permeation" was another word often in his mouth. It was a confusing way of saying Fifth Columnism and another excellent example of the strong grip they had upon the idea of preventing the ordinary man from perceiving what was being forced upon him.

This permeation was first into the Liberal Party, which for centuries had had a large part in the government of Great Britain, and they selected as the man to be betrayed, not a weak or unintelligent man, but an astute and wily Welshman, Lloyd George.

Time does not allow a careful survey of the picture but by 1925, so long ago as that, the Socialists by persuading Lloyd George, the leader of another party, the Liberals, to do their bidding had involved Great Britain in an expenditure of $712,000,000 in social service in one year. This figure was $268,000,000 more than the expenditure on defense and $120,000,000 more than all the ordinary expenses of government.

It was, however, incurred by a government that was considered to be a capitalistic government. The resulting confusion was laid at the door of capitalism; it was the failure of free enterprise, and the evils that followed were nothing to do with the generous attempts to meet the Socialists' pleas.

They, of course, knew from the first that there is no compromise along these lines. They had elaborated a first-class technique which induced those not in sympathy with their ideas to adopt them and then to blame that government as representing capitalism for the failure.

Too late Lloyd George woke up to the fact that he had been duped and he began to utter his warnings, but the old Fabian method of picking off a nation piecemeal was proving its success. Business stood idly by while the medical services were tampered with; some doctors were persuaded there might be something to say for taking over the coal mines; those interested in coal mines, that a nationalized transport system might be to their advantage, and so on. Soaking the rich was the unifying cry and no one realized that the whole thing added up irrevocably to Socialism, and the loss of liberty and the abolition of the life they had known and its substitution by an all-powerful State which would impose drastic controls on all members of the population.

The speed of the Fabian success was unbelievable. They were not well organized until 1905 and at that time England was a virile nation, well capable and strenuously endeavoring to meet the demands of progress and to improve conditions for all. The undermining of these efforts while ostensibly supporting them was the Fabian constant effort, and by 1914 they had succeeded in placing some of their members in the Cabinet. By 1923, at the time Lloyd George first perceived his error, they had managed to have one of their members, Ramsay MacDonald, elected to the prime ministership of England and the whole change was effected in 17 years.

And who now was the official opposition in the British Parliament? Gone forever was the old Liberal Party and reigning in its stead were the Fabians, who had at that time adopted the highly appealing title of the Labor Party.

The whole transformation was truly an exhibition of the century-old methods of Quintus Fabius. They had permeated and annihilated the Liberals; their final triumph was in persuading Asquith, the Liberal leader, to hand over to them, although they only had 191 seats out of the 615 seats in the Parliament and represented only one-third of the electorate.

They had persuaded a capitalist government to govern on socialistic lines. They had blamed that government for the failure of their own plans which they had methodically sabatoged. They were succeeding beyond all belief in their highly informed policy of confusion and piecemeal engulfment. How they must have chuckled at the stupidity of the nation.

Who Were the Dupes?

And such changes cannot go on without persuading a substantial number of people that they are advisable, and we may profitably spend a few minutes in reviewing the classes of people who were at any rate not opposed to the change. They were:

Firstly, the Fabians themselves and their convinced disciples.

Secondly, those who while not believing in the doctrine, were willing for their own selfish motives to collaborate. For those people, I have nothing but the most complete contempt. They include members of Parliament who knew better and should have been loyal to their priciples.

Thirdly, there were the truly terrifying mass of people who were well intentioned but half informed. They were mostly those who sought to obtain personal satisfaction from sponsoring so-called enlightened policies but who did not understand the final result of their actions. These people in England today have received a lesson they will never forget, for they have been abused, taxed, controlled and treated by the Socialistic government with the contempt a Socialist has for those deceived into abandoning a way of living which in general was useful to the community and certainly not a harmful one.

Fourthly, we had the vindictive little failures. The doctor who never could get a practice. The indifferent architect who saw a wonderful shelter from competition as a controller of other people's building enterprise; the third-rater in all walks of life who was available and glad to enter one of the bureaucratic institutions where he could vent his desire for power upon his fellow citizens.

Fifthly, we had the working man who was persuaded that he was to be the sole concern of the Labor Party and who, in the main, could not be expected to take more than an opportunist's view of the situation. For the betrayal of those decent working men the Socialists will have a long tally to

answer. I have heard more vitriolic abuse of the Socialists from the better class of working man than from any other section of the community.

By 1937 it was obvious that many of these people were waking up to the true intentions of the Fabians and of their domination of the Labor Party, and it is my own opinion that in normal circumstances this awakening would have gone on to the eventual defeat of the Socialists, but they had in 1939 an unbelievable stroke of luck, and Hitler invaded the Sudetenland.

The living peril of Germans massing across a short 25 miles of sea turned every true citizen's efforts to an all-out attempt to defend his country. I well remember those days, the epic battle of Britain and the mustering of every person, young and old, sick and well, to the defense of his country.

Because I was a veteran of the first World War, I was put in command of a unit of the Home Guard and solemnly drilled elderly men in the use of broomsticks which we hoped might one day be replaced by rifles.

We sat up all night putting a sticky mess of tar and gasoline into bottles which we intended to throw at the German tanks as they came upon our towns and villages. We listened to that great man, Winston Churchill, as he told us of the realities of our danger and encouraged us in his matchless prose, and we cheerfully endured a hell of bombings, V1s and V2s, until victory came.

I do not recall, during the whole of that time, anyone approaching me with the idea of insuring a conservative government after the war.

But not so with the Fabians.

Systematically and thoroughly they pushed their viewpoint wherever they could; upon the troops at the front and in the factories through the shop stewards, an effort which by its very un-Englishness never evoked the opposition it should have done, and then, with the all-important help from your own great country, the war ended.

The Postwar Take Over

It was obvious we had to have another election. The Socialists pressed for the earliest possible date, and with many of the troops voting by proxy, with husband separated from wife, and with the ravages of war upon the land, we went to the polls and woke up the next morning to find that the Fabian dream had become a reality and that of the 640 seats in the House of Commons, 400 were in the hands of the Labor Party, and that Winston Churchill, who had led us with such magnificent courage and ability, was no longer prime minister.

Now I have told you that the Fabians never numbered more than 4,000 members, but of this 400 majority, 230 were members of the Fabian Society and 31 were in high government office and in the Cabinet.

I imagine any group of 4,000 people who could muster 58% of your Senate would feel that they were very much to be counted with.

And what kind of men are they?

Well, the first act of the assembly in the British House of Commons was to sing the revolutionary song *The Red Flag*. I can hardly bring myself to admit it. And the second thing was to announce that they wanted a raise in their pay as members of Parliament. They had described themselves as lawyers, doctors, architects, business men and the like. But so unsuccessful had they been in their private lives that, for the value of their services to their country, they wanted a raise in pay.

And who were these men?

By their own replies to a questionnaire, only 17% had ever attended high school and 43% had attended no school after the age of 14 years. Sixty-five per cent of them were the sons of manual laborers, skilled and unskilled. Now I am the last person, having spent so many years of my life with the poor in hospitals, to say that the son of a manual laborer should not attain any position he can achieve, but I do say that it does not, coupled with no schooling after the age of 14, give him a prescriptive right to govern 50 million people.

But in fact it meant very little, for after an early exuberance they soon found that they were of very little importance. They were there to vote the dictates of their Socialist bosses on pain of being ejected from their posts. To their eternal credit, some of them have stood for their principles and have been ejected, but the majority file in when told and vote as the party dictates.

And we may now spend a moment or two in surveying what they have done, and please never overlook the fact that a million fewer people voted for the Socialists in the 1945 election than voted against them in the previous election.

In other words, the mandate they claim to have had was not from the majority of the people.

And what have these people done with a mandate which represented the will of less than half the population?

They have nationalized medical services, dentistry, coal, gas, electricity, long-distance trucking, civil aviation, internal waterways, railways, buses, subways, and have inflicted controls of the most drastic nature upon housing, currency, travel, clothing, education and on many other aspects of life.

What Nationalization Means

And I should like to say a few words about nationalization because I find very few Americans know what it really means. It does not mean that you carry on your business as before but with stringent government controls; it means that one day you pick up your hat and coat, the photograph of your family which stands on your desk, and you walk out of your office never to return and the bureaucrats take it over lock, stock and barrel. You will be given permission to arbitrate the value of your business, it is true, and tribunals of honest men will arbitrate, but when it comes to payment you will find you are to receive part of a total sum which has been allocated to recompense everyone.

The same applied to the doctors. The methods of deciding the value of their practices was not fair. The compensation was not payable until age 60 or compulsory retirement and, since it represented in most cases a great part of the doctor's life savings, it was a crushing blow, particularly when it is realized that the remuneration they now receive, plus savage taxation, makes it quite impossible for them to save for their retirement.

And at this point perhaps I had better explain why I have not dealt in detail with the workings of the National Health Service. It is because, as I hope to explain to you, it is in my view a sterile and profitless occupation.

Some years ago I read in a medical article that Lenin had said that "The cornerstone of the arch of a Socialized State was a Socialized system of medicine." I could not make any real sense out of this, and so I went to the British Museum reading room to read what Lenin had said. Slowly I realized that Lenin had appreciated just what the Fabians repeated later, that no nation in its senses would accept Socialism or Communism if they understood what it meant, and that therefore it had to be introduced insidiously and through the emotions. The most emotional thing they could think of was birth, death and sickness, and from that date, wherever the doctrine has been introduced, it has been the medical services that have been attacked and first taken over.

I do not take a favorable view of the working of the National Health scheme if for no other reason than the appalling cost and the abuses of it, but to me this is the wrong approach. Since 1884 when Bismarck tried it, the medical professions have always been the ones first to be attacked. They have been the objects of the Socialist

attack, which have spread out from there. An understanding of this puts the socialization of medicine in the right perspective and enables one to avoid the Socialist trap of being bogged down in futile arguments about the working of the scheme while the true meaning of it is being obscured.

One thing is quite certain, that when Great Britain throws off her Socialist shackles and men can once again go to work to carve out their own lives and young men and women leaving college can have the wide choice of occupation which free men should have, then the limitations of the scheme will sadly reduce the quality of man who will want to enter civil service medicine.

As to the cost of all this socialization, it is, of course, astronomical. The figures are there for anyone to read. In the first 18 months of the National Health Service no less a sum than $2½ billion was spent on it. Now a billion meant nothing to me, but in these days of government spending by billions, I tried to get some idea. There have been a billion minutes since the birth of Christ and only a billion minutes, and so I envisaged a figure starting at that time and every minute, day and night, right up through the Middle Ages until the present day, throwing $2½ on to the ground. That fantastic sum of money was spent by the Socialists in 18 months on the National Health Service. Where did it come from? Well, of course, from the taxpayer of Great Britain and he will go on finding the money on a scale which the Socialists themselves estimate will rise for the next 30 years.

We have, I am glad to say, begun to put a stop to all this and at last year's election we turned out nearly 100 of these Fabians, and in God's good time we shall get rid of them completely. But Socialism is like polio; you do not know when you catch the disease; by the time the diagnosis is made it is too late to avoid it, and if and when you recover, you have a lame leg. The changes of Socialism are irreversible.

Now I do not intend to commit the impertinence of advising any Americans on what they should do, and if America wants to adopt Socialism, much as I regret it, it is no business of mine; but perhaps I may be persuaded to say this, that if America does not want Socialism, the time is very short which she has to acquaint herself with the tactics of the Socialists and what she may expect to suffer if she admits the first and apparently innocuous step.

The travails of my own great nation are there for you to see. You speak our language and are our friends. You have an unexampled opportunity to make your decision on facts.

UC Courses Keep Engineers Abreast of New Developments

Technological advances in the last decade have surged forward with such dynamic momentum that the world has been awed and inspired. And the engineer, who in many instances has loosed these marvels upon the earth, finds that the burden of keeping up with them is a responsibility that he is incapable of assuming alone.

The breadth and scope of his own engineering, the correlation of progress in related fields, and finally, the relentless advance of new and pioneering fields leave him under a morass of knowledge that is staggering. Yet, to remain alert and advised in his particular field, he must keep with it somehow. He must continue an education which seems only to have started after his university training ended.

Fortunately, his dilemma is not his own. Educators are frank in recognizing the limitations of a college course, and as a result, most universities have taken over the problem for the individual, offering various means for achieving his growth with the times.

In this respect, the University of California presents an invaluable program through a Division of Engineering Extension. Its specifications are geared to fullfill the individual requirements of an engineer as he knows them. His choice rests in (1) formal classes, (2) institutes, and (3) "in-plant" company-sponsored courses or conferences.

Perhaps he needs a full course on a particular subject — electronics, high-speed aerodynamics, metallurgy, or city and regional planning. Then, he could enroll in a formal evening class on, or off, one of the University's campuses; these usually meet once a week for two, or two and a half hours, in the evening, for 15 or 18 weeks. During the past year some 6,000 Californians took advantage of this particular facility.

If an engineer is interested in the latest development in a particular field, however — work simplification, for example, or fluid mechanics, heat transfer, or television — he may wish to attend an institute or seminar. These are normally held on one of the University's campuses for a duration of two or three full days.

The meetings present specialists and authorities in the field. Some are professors, others are laboratory men, and others represent industry. This type of high-level conference presents its information in concentrated form. It saves time and the energy of busy men.

Then, a third, and unique facet of this advancement program, is conducted in cooperation with industry — right where the ultimate benefits of the program are put to use. This "in-plant" training is set up and offered whenever an individual company or concern expresses a desire for specialized courses for a group of its employees. All administrative and instructional problems are handled on a contract basis by the University's Engineering Extension and either division, at Los Angeles or Berkeley, undertakes this service upon request.

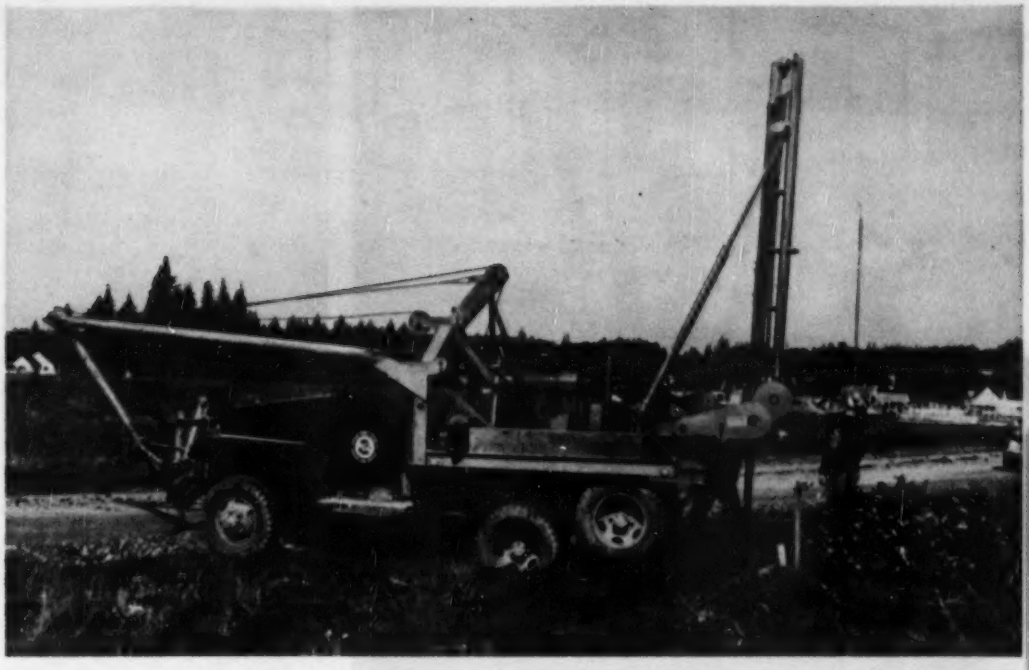
As a matter of fact, portions of all these three phases of "continued education," have been offered throughout the state. Localities already served include Berkeley, China Lake, Fresno, Hollywood, Long Beach, Los Angeles, Marysville, Oakland, Pasadena, Sacramento, San Diego, San Francisco, Stockton and Vallejo.

Courses offered cover all fields of engineering — industrial, chemical, civil, mechanical, electrical, as well as mineral technology. Most of the courses, by the way, do not yield credit in the regular University though a few of them may be used to fulfill undergraduate requirements. The idea is "postgraduate training" with less emphasis on part-time work for an undergraduate degree.

The engineering education planning is done by the Divisions of Engineering Extension at Berkeley and Los Angeles. These divisions, while a part of University Extension, are also divisions within the Departments of Engineering of the University and are of equal rank with other divisions in the University's engineering framework.

Several faculty members devote a part of their time to extension planning. The academic training of these supervisors is combined with frequent contacts with industry of the area and a vast amount of experience in adult education gained through the University's experience in World War II's engineering, science, management war training. The University ESMWT program, by the way, gave training to 151,000 Californians during the war.

With facilities such as these, so near at hand, with so much forethought and planning behind them, no engineer need forsake the privilege of continuing a process of learning that might well be lifelong. As a matter of fact, he could hardly afford not to participate in a program so expressly designed to solve his peculiar dilemma.



Savings of from $3,000 to $5,000 a year are effected with this two-man front-mounted live boom derrick and hole digger equipment

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S. J. Pearson
Portland General Electric Co.

Two-man digger-derrick, pole wrench, Industrial Monkey, boom-mounted platform and wood chipper save more than $50,000 a year

Pole replacement and tree trimming are two big jobs that are always with an electric utility. During the past year the Portland General Electric Co. has developed new methods and equipment that have effected savings in these two operations in excess of $50,000 a year. For pole work four divisions are equipped with self-powered mechanical hole diggers mounted on six-wheel-drive International trucks. Since these diggers require only two men for their operation, the next step was to equip them with a derrick that would enable two men to set poles of any height under practically all conditions. The derrick illustrated was designed by Pat O'Connor, general line foreman of PGE's Oregon City Division. With this live derrick two men can set up to 70-ft. poles. Yet in traveling position it complies with highway regulations for length and height. It can be extended to its maximum length in less than two minutes and can lift a load of 8,000 pounds.

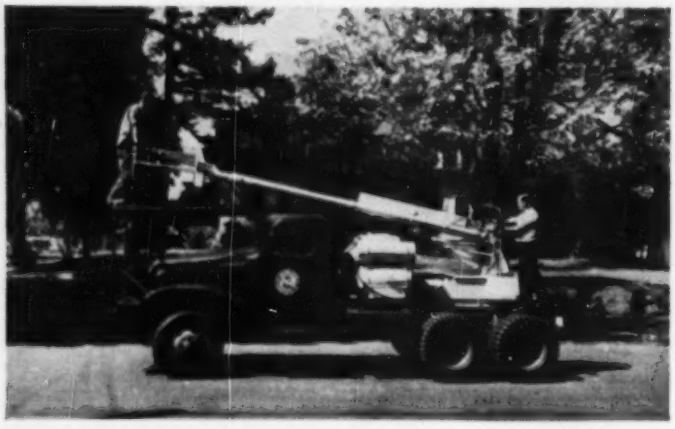
This boom-mounted insulated platform saved $4,000 on one wire replacement job alone

The live derrick feature and the front mounting make it possible for the driver to maneuver the derrick into any position with ease and safety. He has an unrestricted view of the other man and his derrick load at all times. The derrick is operated from a non-freewheeling double-drum winch to the rear of the cab. This equipment is saving the utility $3,000 to $5,000 per year per unit over the best previous methods on pole replacement alone. In addition it is a very handy derrick for installing and removing rack-mounted transformers and other heavy equipment.

Since there is not enough pole work in most divisions to keep the two-man crew busy, the platform extension shown was designed. From this the men work in their spare time assisting other crews or doing tree trimming. If

Wooden platform for line work increases use factor on hole digger-derrick equipment

The digger-derrick complies with highway traffic regulations when in traveling position



Industrial Monkey in traveling position. This equipment is saving utility $50,000 a year

Secret of two-man pole setting rig is front mounting of derrick so that operator has an unobstructed view of work at all times

two men are needed on the platform, a journeyman is borrowed from one of the regular line gangs. From this platform men can work up to height of 45 feet, performing midspan repairs, tying in, transferring, and many other jobs. On one wire replacement job this platform saved the company more than $4,000.

Two other items which help on pole work are four-wheel pole trailers and a specially designed pole-wrench. With four-wheel pole trailers a two-man crew can haul up to twenty 40-foot poles in one load. This is about all that can be delivered, dug and set in one day. The pole-wrench shown is another invention of O'Connor. This gives one man complete control of a pole. It locks on the pole by merely pushing the handle down. Since it will turn the pole either way without coming loose, it is a simple matter for one man to guide and face a pole in the hole.

Industrial Monkey

Equipment estimated to save $50,000 a year in tree trimming costs is the Industrial Monkey, shown in one of the accompanying photographs. This is equipped with pneumatic pruning tools and is accompanied by a Fitchburg chipper. The Industrial Monkey is a hydraulic piston with a self-leveling cage on the end. The cage is insulated from the boom and tested at 10,000 volts. Maximum elevation to the floor of the cage is 33 feet. The boom will rotate 270° and is con-

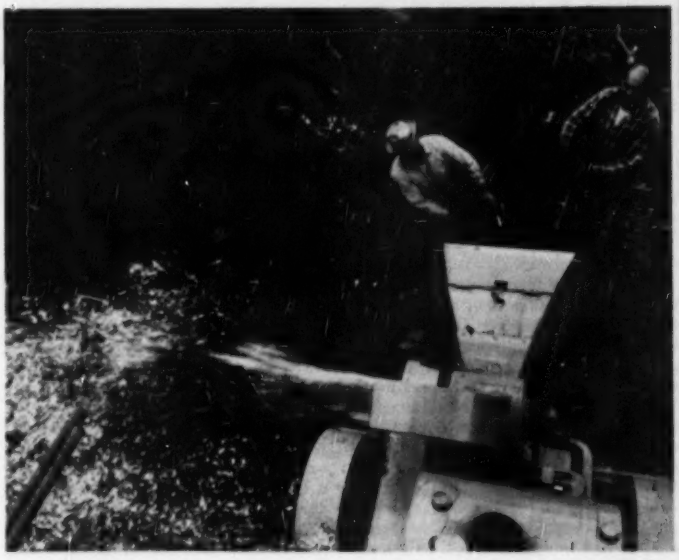
Special pole wrench makes it possible for two-man crew to set poles up to 70 ft. in length. Raising the handle releases hooks

trolled by foot-operated switches in the cage. There is a duplicate set of controls in the truck cab. Power is furnished by a hydraulic pump operated by the truck motor. A safety switch is provided in the cage with which the operator can stop the truck motor. Even with the power shut off, the operator can still lower himself by operating the lowering switch. The boom will extend 26 ft. over the side of the truck. Even at maximum extension no outrigger or counterbalance is required when the unit is mounted on a fairly heavy chassis such as a 2½-ton six-wheel International.

The unit is equipped with an air compressor for operating pneumatic tools. Air is piped to the cage through the boom. A short length of hose is used to connect the tools to the air line. In addition to tree trimming this unit is used for street light maintenance, reinsulating, wire stringing and many miscellaneous jobs.

Since tree trimming involves brush disposal as well as actual trimming, considerable study has been made of brush disposal costs. As a result Portland General Electric decided to use the Fitchburg chipper shown to dispose of the brush. The unit shown will dispose of limbs up to six inches in diameter. The resultant chips can be burned or used as a mulch. In rural areas the chips can be blown into the woods or fields along the road. In built-up areas the chips are blown into a dump truck and hauled to the company's hog fuel pile where they are used for steam-electric generation.

Industrial Monkey has reduced tree trimming cost to a fraction of doing it the hard way



Gas-engine chipper that solved the problem of brush disposal in tree trimming work

Traffic interference is reduced on downtown Los Angeles street by use of tee boards to keep spoil pile in middle of street adjacent to trench. Traffic interference caused by utility underground construction can create a lot of very unfavorable public relations

Traffic Interference Must Be Reduced

Utility management should immediately recognize its responsibility in reducing traffic interference. Failure to do something will inevitably bring about restrictive legislation that will greatly increase underground construction costs. L. A. handles problem through substructure committee

George C. Sopp
Los Angeles Department of Water & Power

Public utility management is not entirely aware of its part in creating surface traffic interference. The problem has not been studied sufficiently to apply remedial measures. Utility construction, maintenance and operational work, while necessary and vital to community and city growth, is nonetheless responsible for a large part of street traffic interference in many of our fast-growing Western cities. Public streets and highways in and through our cities are carrying an immense load of motor vehicle traffic efficiently and effectively to the limit of their capacity. Any interruption of flow causes large-scale traffic bottlenecks. These are irritating, dangerous, and costly.

Utility management should immediately recognize its responsibility and gear construction and maintenance work programs toward reducing street traffic interference to a reasonable minimum. If utility management fails to recognize its responsibility and does not do something about it immediately, it inevitably will be saddled with restrictive legislation. Such legislation would materially hamper job progress and sharply increase costs. It would necessitate nighttime and week-end work, requiring overtime pay and less efficient work hours. Underground construction costs would greatly increase.

The increase in vehicular traffic in Western cities is in direct relation to the unprecedented growth in population of the West. Large cities are not alone in being confronted with the problems of surface traffic. Practically every community has at least one or more major arteries of vehicular traffic piercing its business or residential districts. These in nearly every case are used by one or more public utilities as a means for the distribution of their services either through a substructure, surface public conveyance,

Effective use of toe boards and barricades permits only minimum blocking of traffic as shown in this underground construction view looking down a busy Los Angeles street

or overhead distribution facility. All require the use of the street for construction, maintenance, or operational work.

Los Angeles has done something about this problem. For many years a committee known as the Substructure Committee of Los Angeles has been functioning. All utilities, both public and private, are represented. These include electricity, gas, water, telephone, telegraph, railway and oil pipe lines. One of the main objectives of this committee has been to reduce surface traffic interference occasioned by underground construction. A great deal has been accomplished through cooperation. There has been no need for restrictive legislation. A subcommittee has produced a booklet entitled *Surface Traffic Interference*, which deals comprehensively with the subject.

Traffic Interference Causes

There are three principal causes for surface traffic interference generally covered by the terms *excavation, open manholes* and *vehicular parking*. Any one or all of these may be caused by construction, maintenance, or operational work being performed by public utilities.

Excavations

The unusual growth in population of our Western cities has made necessary the unprecedented extension of public utility facilities. This has required an abnormal amount of street excavation to provide for these facilities. The public expects a reasonable amount of traffic interference that it ultimately may enjoy the utilities' services. But it is entitled to a minimum of interference in such extension of service.

Unnecessary traffic interference is caused many times by the failure to remove or rearrange barricades and work equipment as the job progresses. Excavations not promptly processed to completion create an unnecessary and lengthy interference to traffic flow. Cooperation between the traveling public and those required to do work on the public highways is essential. The public utilities and the motoring public are *in partnership* in the use of public streets and highways.

Public Relations and Traffic Interference

A good public relations program is vital to all progressive public utilities, particularly as the utilities are seen by citizens while working on the public streets. Because of this close relationship with the general public and utility consumers it is necessary that the utilities perform work efficiently and effectively. Street traffic interference caused by such work should be kept to a minimum so that the traveling public may not be unduly incensed against the utility.

In the utility field there are a multitude of operations. There are the necessary routine day-to-day jobs, many of which may offend the public when done carelessly or thoughtlessly. A public utility is very likely to be judged efficient or not by what the general public sees, as well as by the services it renders.

Street Barricades

Excavations made in streets or highways should be protected by barricades and proper warning devices to safeguard both the workers and the general public. Such barricades should not in themselves create additional interference to traffic. There should be a sufficient amount of barricades, such as wooden fencing, wooden horses, and other approved devices, to protect properly both motorists and pedestrians. And last, but not least, the men performing the work must be considered.

Spoil Bank

Excavated materials which are not properly placed at or near the excavation may in themselves add to traffic interference. They may also be a dangerous liability in wet weather. Toe boards or bins adjacent to the traffic side of the excavation, as illustrated, will permit maximum height of spoil pile without danger to the motoring public. Surplus spoil materials that are not to be used should be removed from the location of the excavation without delay. Where excavations occur in intersections it may be necessary to haul away the material immediately, even though a part of the material may be required to backfill at the completion of the job. This is preferable to blocking the intersection by large spoil piles for the entire duration of the job.

Where possible, excavated materials to be used for backfill should be stored in bins in back of the curb to occupy minimum space as shown in one of the photographs. Here effective use of toe boards and guard rails can properly protect motorists and pedestrians.

Steel Plates

Steel plates properly placed and firmly held in position over an open excavation permit practically unimpaired traffic flow and cause a minimum of traffic interference. Steel plates like those shown are of particular advantage in street intersections. They are especially desirable for small-size street excavations on major highways and heavily traveled streets. Steel

Use of tee boards on traffic side of spoil pile neatly confines excavated materials

Trucks and work equipment are carefully placed along the job to create least possible traffic interference. Equipment not in use for long periods is taken to a side street

plates should be required at intersections where the location of the excavation is such that not only two-way traffic but four-way traffic might be interrupted if barricades were erected.

Manholes

Substructure facilities such as terminal and junction vaults, transformer vaults, large meter, valve, and regulating stations, as well as other underground installations, are made accessible by means of manhole openings in the street. This type of street opening lends itself to the minimum amount of interference with traffic. It does not require additional space for excavated materials or equipment that might impair the flow of traffic. Manholes also can be closed up at the conclusion of the day's work or at the termination of the job without hampering the flow of traffic. When necessary to open a manhole, the utility should time the work to coincide with the off-peak traffic load. In this way traffic interference can be kept to a reasonable minimum, particularly on major and heavily traveled highways.

Work Equipment

Mechanical equipment, including trucks and cars, essential for the job should be placed on the street or highway so that unnecessary interference to traffic will not occur. It may be that equipment used only intermittently should be removed from the particular street when not in use and parked elsewhere. It can then be returned to the job when necessary for its use at a later period.

Parking

There is considerable misconception as to the privilege of parking public utility vehicles without police interference. Some large cities have ordinances prohibiting the parking of public utility vehicles in other than a strictly legal manner. However, public utility vehicles are generally considered as "authorized emergency vehicles" in most cities. They can be parked at or near the job location irrespective of general parking restrictions.

Double and triple parking of public utility vehicles usually causes serious traffic interference. This is not conducive to good public relations. Vehicles should not be parked in such a manner except in extreme emergency cases. The thoughtless parking of cars by supervisors and department heads in their anxiety to be on the job either for job direction or occasional inspection creates or adds to the traffic interference problems.

Police Responsibility for Traffic

Police authorities of city, county, and state governments have a definite and direct responsibility for the movement of traffic. In most instances they have jurisdiction over the use of such streets. Especially when traffic flow is unnecessarily impaired by improper and excessive blocking of the traffic lanes.

Public utilities should recognize the authority of our police agencies. They should definitely cooperate with the police by not unduly adding to their problems of handling traffic. Cooperation and a sympathetic understanding of the utilities' problems by the police can be of tremendous value. Police cooperation is especially important during times of emergency situations.

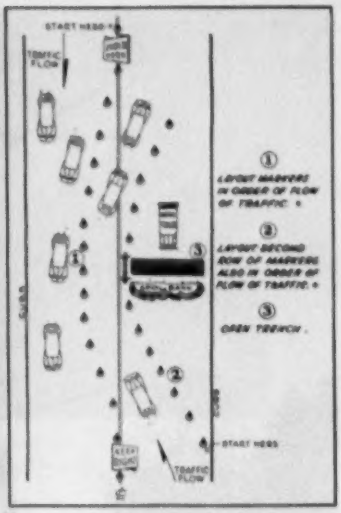
Traffic Interference and Highway Accidents

Public utilities have found that many accidents occuring at or near their work in public streets are the result of some form of traffic interference. Many of these accidents may

Close-up view of gutter cover plates which permit unhampered drainage under spoil pile

Stockpiling of spoil material in parkway is done to keep street as clear as possible

Use of steel plates covering excavation at intersection and curb spoil bin are shown


START HERE
TRAFFIC FLOW
① LAYOUT MARKERS IN ORDER OF FLOW OF TRAFFIC.
② LAYOUT SECOND ROW OF MARKERS ALSO IN ORDER OF FLOW OF TRAFFIC.
③ OPEN TRENCH.
START HERE
TRAFFIC FLOW

Type of drawing used in training courses to show proper layout of traffic markers

well be charged to confusion on the part of the motorist due to the lack of sufficient or positive warning devices ahead of, and at the location of the work. The accompanying diagram shows proper use of markers. Utilities have found that damage claims resulting from their operations have risen sharply with the increased traffic load operating at higher road speeds.

It is interesting to note that when street traffic interference occurs many motorists take untimely driving risks in their impatience to arrive at their destination according to a time schedule. Others may take dangerous driving risks merely to satisfy the irritation of an inferiority complex. They are momentarily aided in the development of their ego by the horsepower of a powerful automobile. Many of these driving risks result in accidents at or near the location of traffic flow interruptions.

A Step in the Right Direction

With this knowledge of the problem of surface traffic interference by public utility operations, corrective measures for eliminating their contributing part can be put into force. Measures to minimize traffic interference should be made a part of job planning and a definite part of standard practice methods.

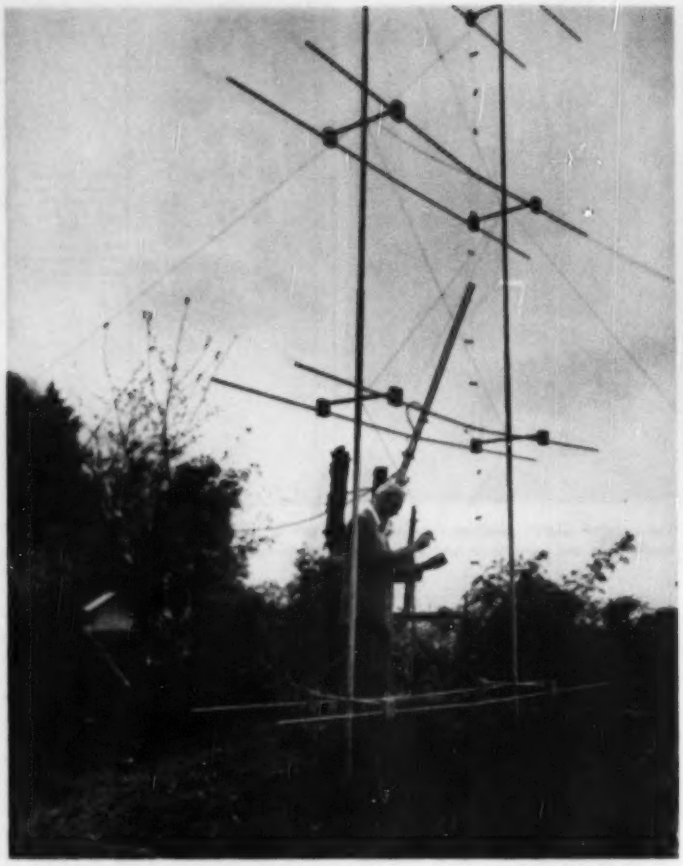
Many public utilities have already initiated a concentrated program of training for their key and first-line supervisory employees with amazing results. In some instances private contractors have adopted this program and are training their employees in better methods for handling traffic when working on the public streets.

The Water Distribution Division of the Department of Water & Power of the city of Los Angeles obtained immediate results by special effort in training employees towards reducing traffic interference. It has been found that a continuing awareness on the part of foremen and key supervisory personnel showed up immediately. It appeared in better routing of traffic through and around street jobs as well as in planning and executing the work. Much healthy competition among various crews also resulted.

The basis of this training was use of the booklet previously mentioned, *Surface Traffic Interference*, recently compiled and published by the Substructure Committee of Los Angeles. Public utility management could use this compact booklet to advantage. It carries a training program outline which can be adapted to the particular needs and conditions of any public utility. It is unquestionably material for effective presentation of the subject.

Most of the excellent photographs used in illustrating this article were supplied through the cooperation of the Southern California Gas Co.

Gutter protection plates in place with advancing trenching machine placing excavated materials over the gutter plates. These permit unhampered drainage under spoil pile



Type of dipole antenna used to serve fifty or more television receivers in Astoria, Ore. Signals are picked up from Seattle's television station KING 123 air line miles away

Smaller antennas are numerous. They feed a coaxial cable serving four to ten sets

Three-tube amplifier steps up antenna signal. Amplifiers are spaced from 500 to 1,000 feet

TV Reception

Astoria, Oregon, has more than 200 TV receivers operating from community antennas with amplifiers and coaxial cable

Consistent television reception with excellent pictures is being had in Astoria, Ore., from a TV station in Seattle. The distance is 123 air line miles with mountains in between. Astoria now has around 200 TV sets. How is this possible?

That is what an editor of ELECTRICAL WEST went to Astoria to find out. If results in Astoria can be duplicated in other remote communities, utility people are very much interested.

Briefly, here is the story. A man by the name of L. E. Parsons operates a radio wholesale and manufacturing business in Astoria; installs and maintains high-frequency equipment on the salmon fishing fleet; operates a local radio station and maintains a retail radio and appliance store. He is an old timer in the radio business. He became interested in trying to find usable TV signals in Astoria when Seattle's television station, KING, went on the air about two years ago. He met with no success until he developed an extremely sensitive field strength test set to locate signal areas and built a high-gain amplifier to raise the extremely weak signals to values usable in commercial television receivers.

Coaxial cable (faintly seen) runs from house to house to serve as many as 75 TV sets. Customers own the cable and amplifiers

Imagine finding television sets on sale in an appliance store in Astoria, Ore., 123 air line miles from TV transmitter in Seattle

Over 123 Air Line Miles

He found some very interesting things. The signals he found usable were definitely not sky waves nor reflected signals. General signal areas are located by driving a car with the test set around the streets. Signal areas may be about 200 ft. wide with some intense signals extending in bands like fingers. Maximum signal is usually found from 3 ft. to 20 ft. above the ground. With a dipole unit with 200 ft. of cable the signal is measured horizontally and vertically. A strong signal finger is picked. It is then traced to a suitable antenna located with the portable test set. A special antenna, of the type illustrated, is then erected and oriented. Signal from the antenna is fed by coaxial cable to a three-tube amplifier as shown. From the amplifier coaxial cable is run from subscriber to subscriber. Some of these cables run as much as a mile and will have 50 to 75 subscribers. An amplifier is required every 500 to 1,000 ft. to overcome signal attention in the coaxial cable. Sixty-cycle, 110-volt power to operate the amplifier is supplied over the same coaxial cable, so that there is no power supply problem. The amplifiers require 50 watts. If more than one TV signal were available, multichannel amplifiers would be used so that subscribers would have a choice of stations. The coax is run from house to house as may be seen in one of the pictures.

Parsons' interest in the matter is only in performing a consulting service to locate signals and in supplying the antenna, coaxial cable, and the amplifiers. Of course, he sells television sets in his retail store, too. When as many as seven people go together to install television, the cost to each is only about $100, exclusive of the TV receiver itself. For the larger numbers served from one antenna and one coaxial cable run, the cost is of course much less.

There are two antennas in Astoria serving around 75 subscribers each. Then there are a number of smaller groups of four to ten, making around 200 sets in Astoria up to the first of May of this year. Parsons only began selling installations the first of this year. He spent a year or more in experimentation and working out bugs until a commercially dependable service could be offered.

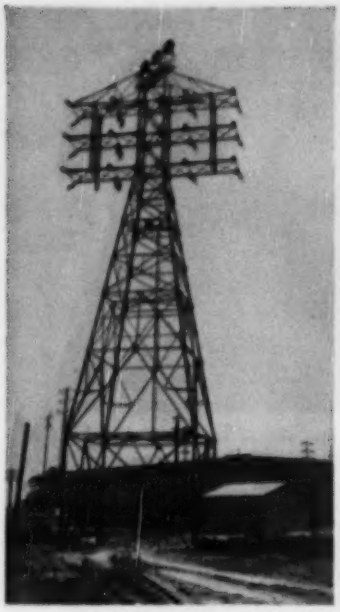
Customers own all of the equipment so that Parsons is not in the utility business with franchise and other problems. The FCC has no objections to what is being done and the Seattle TV station is glad to be able to extend its coverage. The Astoria city council knows all about it and has no objections.

How Widely Applicable

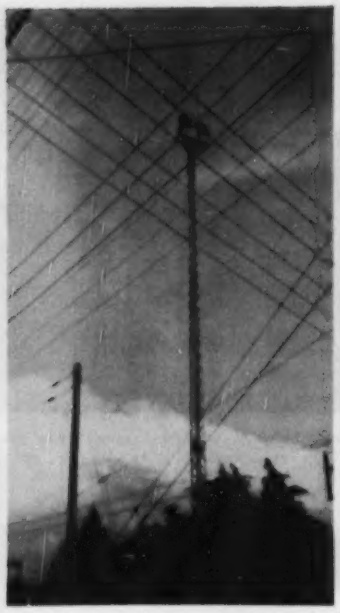
Is Astoria a favored location for some reason? Can other communities do the same thing? Parsons has made field strength tests up the Columbia River to Portland. Tests have been made in and around Portland, Centralia, Aberdeen, Hoquiam, and Wenatchee. Usuable signals have been found in all these localities. To find a signal in Wenatchee was the most amazing thing. The city is located on the opposite side and at the foot of a 10,000-ft. mountain range about 75 air line miles from Seattle. Parsons has learned from experience that there are no signals in flat areas, on beaches, or at or near high elevations. Signals are best in the hills, in slide areas and at the foot of banks or bluffs. Parsons is not boastful and does not profess to have all the answers. He does feel, however, that the Astoria experience indicates that there is still much more to be learned about the propagation of the higher frequency waves.

How does Parsons come out financially on all of this? As stated, he makes surveys, designs and erects antennas, and installs the amplifiers and coaxial cables in Astoria. He is selling equipment all over the country. However, he will sell only to those who will send a service man to Astoria for a week's training in techniques.

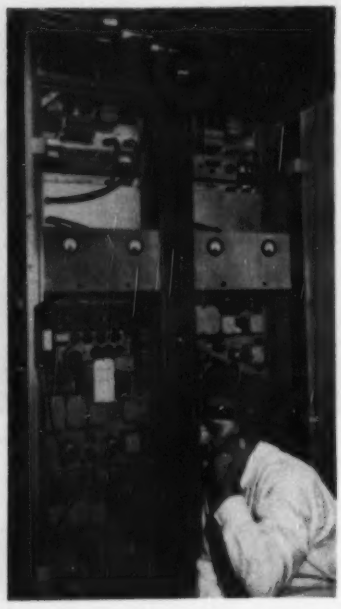
Asked about his system and the future of television in areas remote from the largest cities, Parsons replied that his system is only an interim stage. He expects the FCC to authorize satellite TV stations in the smaller towns and says these will be made part of networks by means of microwave or coaxial cable channels. In cases where a good ground signal is available, such as in Astoria, he thinks a satellite station might operate satisfactorily on this signal alone. Ultimately he thinks TV transmitting stations will be designed to send out stronger ground waves, thus extending the present sky wave range of TV stations.



Multiple transmission tower was used at Colton to mount three parabolic reflectors



Here at Redlands a special 110-ft. steel tower was erected for the microwave antenna



Multiplex microwave channel provides telephone communication of Bell system quality

Edison Microwave Channel Goes In Service

Supervisory control, telemetering and voice paths are provided for in the 952-960 megacycle band

L. E. Ludekens

Electronic Engineer
Southern California Edison Co.

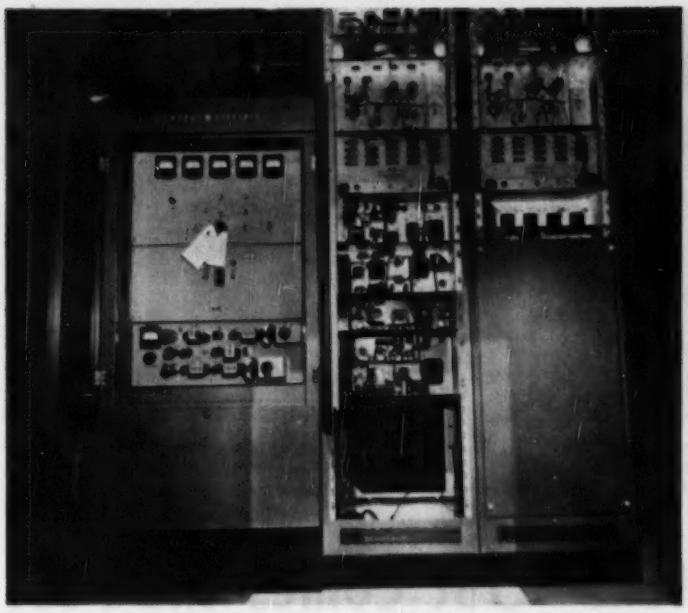
Three duplex ultra-high-frequency multipurpose communication channels have recently been placed in operation by the Southern California Edison Co. This is the first electric utility microwave installation actually to be placed in service on the West Coast. The channels provide operating paths between three substations, Colton, Redlands and Yucaipa, for supervisory control, telemetering, and, for the present, an equivalent wire voice circuit. Radio links were substituted for wire line or cable circuits because of the difficulty in obtaining dependable metallic line routes.

One of the unusual features of the installation is that of channel arrangement. Colton, the attended controlling station, transmits a carrier simultaneously to two normally unattended stations located at Redlands and Yucaipa. The difference in angular location of these stations in relation to Colton is 9½° to the horizontal and 6° to the vertical as shown by the accompanying diagram. Redlands substation is better than 60 ft. clear line of site with a 8.34-mile channel path. The Yucaipa substation link has a barely clear route which will be subject to carrier reflections created by broken terrain in the 16.12-mile channel path.

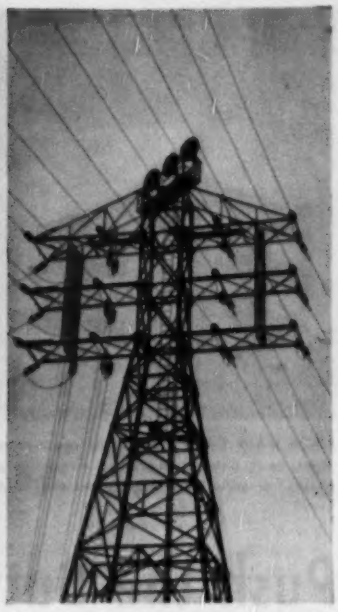
Three parabolic antennas as shown are mounted on an existing 100-ft. multiple transmission tower at Redlands, the attended station. Special 110-ft. steel poles were installed to support the two antennas at each of the unattended stations. Connections to the equipment cabinets were made using ⅞-in. special dry air pressurized coaxial cables extending the length of the steel towers.

Equipment operating in 952-960-mc. band was chosen for a number of reasons. This permitted taking advantage of the channel beam width to cover two stations with a difference in angular location and provided operation more closely related to techniques employed in low-frequency equipment. These relatively high frequencies can be beamed by parabolic reflectors, thus obtaining considerable power gain at the receivers, and additional security from channel interference. Standard tubes are still used at this frequency with subsequent savings in duplication of plant stock. Present equipment was developed by the General Electric Co.

The present multiplexing application is relatively simple. Channelizing equipment consists of one direct voice channel and four channels of supervisory control and telemetering which are obtained by audiotone units. The



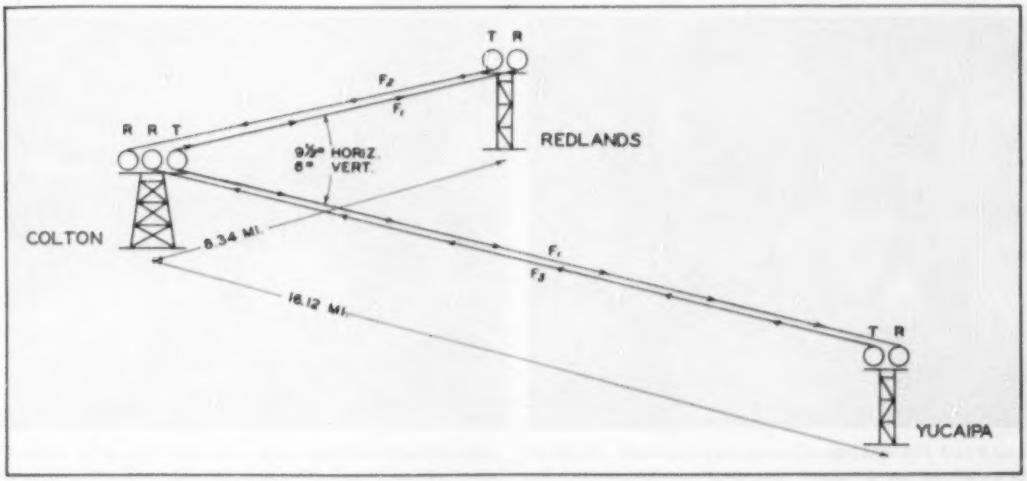
Microwaves panel shown at left of two standard audio signal-type supervisory control equipment cabinets housed in building at base of antenna tower at Colton substation



Transmission tower at Colton provided parabolic reflector microwave antenna support

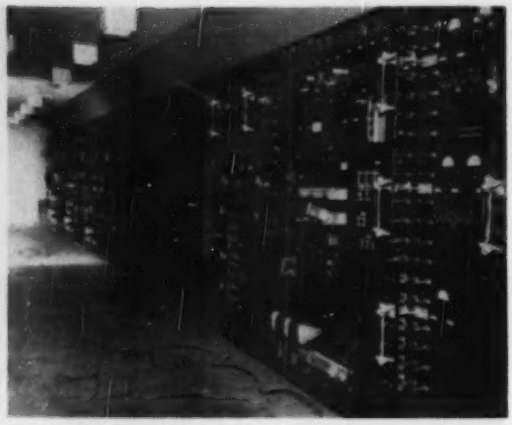
voice channel uses frequencies below 3,000 cycles; the control and telemetering functions use frequencies above 3,000 cycles.

There are three distinct types of communication involved in these channels. First, voice communication between the three substations and to other parts of the utility system over private wire lines; second, continuous telemetering of one selected quantity from each of the two unattended stations; and, third, supervisory control from the attended station to each of the unattended stations, with automatic condition return check. Standard audio signal-type supervisory control equipment as shown is used on this project. The present equipment provides separate indication and control functions. These are as follows: Redlands substation, six telemetering channels, two for voltage and four for current; nine for 33-kv. O.C.B. operation; eight for 11-kv. breakers; nine for 4-kv. breakers; five for alarms, and one for a remote alarm. At Yucaipa substation there are three telemetering channels, one for voltage and two for current; five for 33-kv. breaker operation; seven for 11-kv. breakers; five for alarms, and one for a remote alarm.



Physical relationship between stations. Small angular displacement permits one transmitting reflector to serve two stations

FROM MAIN SWITCHES in a basement room adjacent to a transformer vault, distribution goes out through building at 120/208, three phase, four wire. Bill Bradford, Post chief electrician, at the meters



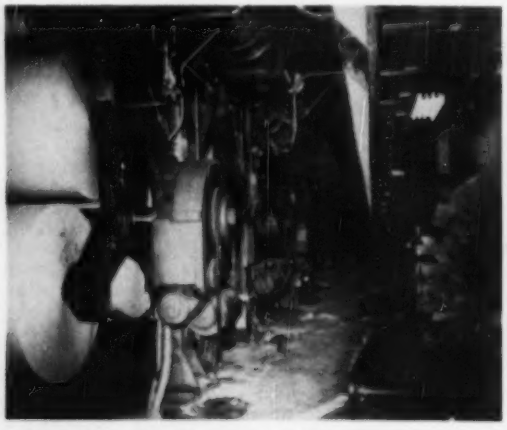
TO PRESS CONTROL ROOMS, one above the other, in full view of the two decks of presses, push-button control wires come to actuate the interlocked motor controls and circuit breakers in these panels

Push the Buttons—Out Comes the Post

Always colorful and spectacular, the *Denver Post*, 55-year-old champion of what it believed were the people's needs in the Rocky Mountain empire, has built itself a new and larger plant and has done it with characteristic flare. Not only is it bigger in size, it is bigger in printing capacity and versatility and newest with electric and electronic control devices. Electrically it has also made use of a novel means to safeguard its long runs of high amperage bus in case of a fault.

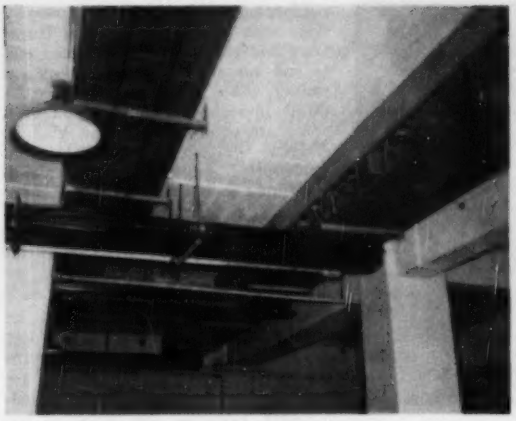
In keeping with the modernity of the entire plant, electric heating wire in the concrete sidewalk is designed to keep it snow free. Air conditioned throughout, even the discharged air is cleaned of ink and lint electrostatically. Lighting of offices and plant is up to modern standards and in some cases unique.

The *Post's* new plant occupies a full half block, 125x400 ft., at 15th and California streets. It absorbed a five-story office building which it completely remodeled, to which was added a three-story-and-basement plant for the mechanical and production departments. Offices of the newspaper occupy the full five floors of what used to be the Temple building. Architect for the project was T. H. Buell & Co., for which Mr. Bobier is engineer. Electrical contractors were Scott Bros. for the Temple building, and Collier Electric Co. for the new plant. Intricate control wiring for the presses however was installed under the supervision of Bill Bradford, chief electrician for the *Post*. The project was two and a half years in building, delayed a total of a

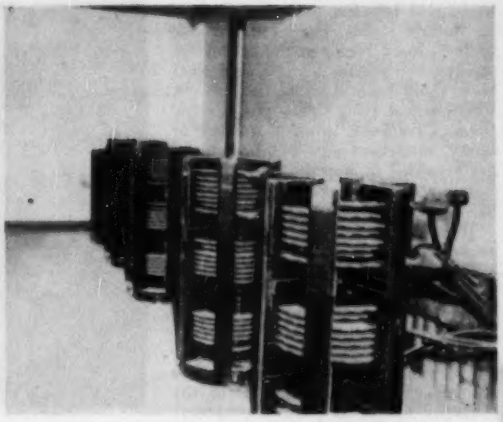


LIGHT FOR THE PRESS interior at the lower deck level is furnished by a continuous row of two-lamp, clear glass covered fluorescent units mounted at an angle on each side and full length of the press . . .

AND EXTENDING TO the paper platform at the end of the press where rolls are stripped of wrapping and prepared to be mounted on spindles of automatic, electrically controlled roll changer and paster.



THROUGH A DUCT SYSTEM designed to increase rather than decrease reactance, power is fed to the presses. The multitude of control circuits from each of the 20 Goss presses is in other ducts



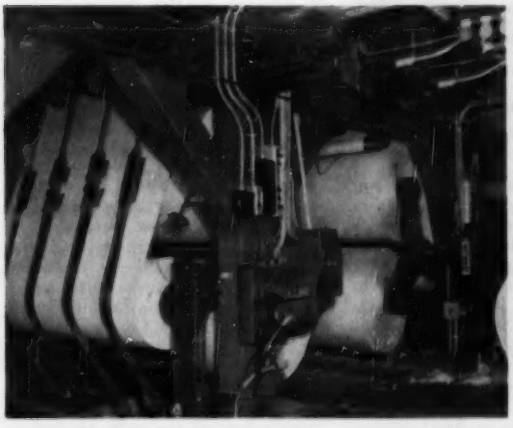
BACKED UP BY REACTORS the 1,250-amp. bus runs are protected should a fault develop at the far end of the long runs. Reactance is increased by spacing buses 10 in. between phases; bars 2 in. apart

half year by strikes.

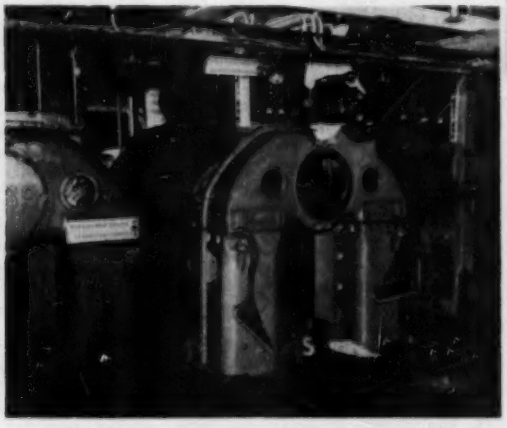
Service from Public Service Co. of Colorado, at 4,200 volts, is received through two 4,000-amp. buses, paralleled, at 120/208 volt, three phase, four wire, direct from a transformer installation in a vault adjacent to the switchboard room. The system is not tied to the local downtown network because of its high density load but an emergency tie is available should the transformer bank fail. A specially built Westinghouse bus duct, made up in five sections, was used for this tie between transformers and main board. From the board six runs of 1,250-amp. bus go to the press control centers to feed the main presses. Instead of seeking to reduce reactance, a usual practice, steps were taken to increase reactance as a safeguard against inrush current in case of a fault at the far end of one of the buses. Hence the buses were spaced 10 in. between phases and 2 in. between bars. Additional reactance was provided by installation of seven reactors. Lighting circuits are given an added 6 to 10% reactance in this manner. Because of high power factor, the main switch interrupting capacity is 100,000 amp.

Another interesting electrical feature is the heated sidewalk. Some 36,000 ft. of Rockbestos soil heating cable containing a No. 19 Nichrome wire was laid on 4-in. centers under the finish concrete to provide a density of 20 watts per sq. ft. The cable was dipped in Novoid compound and cast 1-in. below the top. It was fastened to a wire reinforcing mesh. Circuits were alternated on 8-in. centers, thus bringing them within 4 in. of each other across the 15 ft. width of the sidewalk. These circuits are controlled remotely from five panels of 16 circuits each.

Most modern Goss newspaper presses, 20 of them installed in two rows (and space left for triple the capacity if needed), are intricately controlled electrically. Starting, stopping, inching, reversing either of the whole bank of presses or of individual units or even rolls is provided for. Motors are all designed for 208-volt operation; control circuits are 120 volts. To identify the circuits 22 colors of wire



PAPER PASTER CONTROLS of the Cline system, as well as emergency start and stop buttons for the press unit, are mounted compactly in a control center. Colored pilot lights above can be seen easily



AND INK FOUNTAINS, too, are controlled electrically from a bank of small switches at each press roll. Above some are finished, others were being installed. Note control wire gutter along the top also

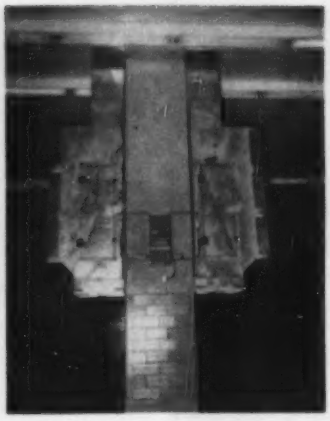
were used between push buttons and the control rooms. The latter are long glass-enclosed rooms at the end of the presses, two stories high, giving clear view along both sides of the presses, where signal pilot lights give indications of readiness to print or not. For safety, numerous push-button stations are provided to stop the presses. Such stop buttons have circuits interlocked to stop the entire line.

These presses are also equipped with an automatic roll changer and paster, a Cline Electric Mfg. Co. of Chicago system. As one roll of newsprint nears its end the pressman can push control buttons which lift a new roll in place, start it revolving at the same speed, and at the right moment squirt paste on that roll and cut the web of the other as the press continues to roll. The roll changer and paster contains an electronic timer that times the paster sequence and the cut-off of each web. It is completely automatic once started. Relays and limit switches operate the movements of both rolls and the spray solenoid and the cutting knife. The whole operation takes place at high speed.

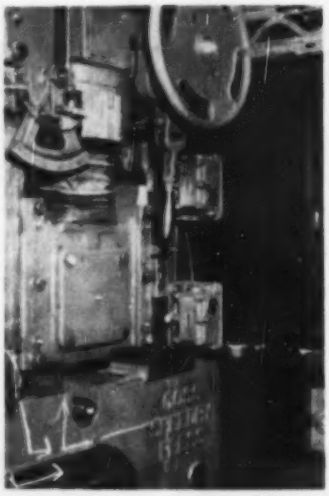
The system also provides an electric web break detector. A pressure switch is kept in by the pressure of the web of paper. The moment it is relaxed the switch opens the corresponding relays and stops the press.

But it is the new rotogravure press that has the intricate electric control. On this nine-unit press (with room for nine more later) *Denver Post* will print its comics, magazine sections and a regional magazine called *Empire*. Color register is important. Hence it is equipped with a photoelectric registering and margin control system. All units of the press are interlocked. Once the register is set the machine automatically keeps in register. This is done with what is called a master cylinder scanner, and is designed to keep register to 5/1,000 of an inch.

Ink for the rotogravure presses is thinned with naphtha and hence the entire area of these presses is considered a hazardous zone and all wiring and controls are explosion proof, as well as the lighting fixtures. The air conditioning system to these quarters contains an elaborate exhaust system with interlock of all controls for immediate shutdown. Air pressure in the press room is kept at a slight vacuum. In the press control room, glassed-in at one end, where circuit breaker equipment is located, a positive air pressure is maintained to keep vapors out. The lighting fixtures in the press room are under air pressure too. A CO_2 fire system is interlocked with the press drive emergency control. It sprays CO_2 inert gas in the room as the fans and the power are cut off.



ELECTROSTATIC AIR cleaners remove the ink mist and lint from the air of the press room before it is discharged outdoors



EXPLOSION-PROOF controls and wiring are used at all points on the rotogravure presses. Lighting in that part of the plant is all explosion proof as well

Minus air pressure is maintained in press room and stereotype room from which air is withdrawn. Pressure is maintained in mailing room and composing room. American Air Filter Electrostatic air filters are installed to precipitate lint and ink mist. The system is adjustable for recirculation of any desired quantity of the air to save heat or to exhaust to the outside and draw in fresh air. For summer air conditioning there are 400 tons of refrigeration provided from four 100-ton Westinghouse compressor units in a roof penthouse with air washers and evaporators nearby.

Lighting of the offices is generally done with continuous rows of three-lamp fluorescent fixtures mounted end to end suspended from an acoustical ceiling, although some offices have indirect incandescent fixtures and even some are equipped with the kind of gadgets which temperamental newspaper people are used to and demand. The press rooms are two stories high, plus the basement. The basement lighting is done as shown in the illustration. A row of glass-covered industrial fluorescent units is mounted at an angle facing into the press on each side.

On the main floor the press room lights are mounted in troffers set in the accoustical ceiling. Troffers are glass covered to keep ink and lint out.

Other electrical equipment is too numerous for details. For example in the engraving department there will be five cameras, two of which are in, mounting 24-in. and 32-in. plates. Luxatron meters are used to control the exposure automatically and regulate lighting intensity from the carbon arcs. Conveyor systems will later be installed between all related departments, such as between press and stereotype rooms to carry plates. Telephone and intercommunicating system are likewise elaborate and the wire services also bring into the building telegraph, teletype and telephoto. The *Post* even has a mobile telephoto outfit which can tap to phone lines and send in pictures developed in transit.

Presses can turn out from 40,000 to 45,000 papers per hour. Each five units constitute a press which can be combined with others for a bigger paper. A maximum of a 128-paper could be printed; 64 pages in black and white is the usual maximum. Circulation of the *Post* is about 400,000 on Sundays, 227,000 weekdays. Space is provided to triple the capacity in the future. Total floor area is 198,125 sq. ft., four times that at the old plant on Champa St.

● DENVER'S CITY COUNCIL adopted a simplified code, based merely on the National Electrical Code, with the minimum of reservations. The recommendations and alternates in the National Electrical Code were changed to mandatory rules where necessary, but that was about all. This ended a long battle between electrical industry groups and the mayor and council over the old Denver Code, which had not been revised since 1927. It also removed the all-metal requirements, which had been characteristic of the old code. The mayor had demanded a liberalization of the code as respecting wiring systems to admit newer methods and any approved by the National Code.

Menu for Inspectors Annual Meetings

More chance for code discussion. A final chance to put in your views relative to new code changes before a new National Electrical Code is published. (Some important questions are coming up—such as the 20-amp. circuit, tamper-resistant fuses, and others.)

Fewer keynote speakers, but all with pertinent topics relating to wiring and the code.

Exhibits of new wiring materials and devices.

Ample entertainment programs to sugar the brain food of the day.

Where and when—

Northwestern Section—Hotel New Washington, Seattle, Sept. 11-13.

Southwestern Section—Hotel St. Claire, San Jose, Sept. 18-20.

Of value to inspectors, contractors, consulting engineers, architects, builders, utility engineers, distributors.

Why Not a 20-Amp. Circuit?

Good old No. 14 wire, the "sacred cow" of the industry, is due for a going over at the inspectors' annual meetings in September. It is being brought to slaughter by no less than the Edison Electric Institute and the Association of Edison Illuminating Companies, the ultra conservatives of the industry. This turnabout of policy comes as a result of a two-year study by a joint committee, assisted by tests made by Underwriters' Laboratories Inc. Now the EEI and AEIC are pushing to have their recommendations adopted in the National Electrical Code. The inspectors, however, have protested such a rush and have gained time to discuss the whole subject at the annual meetings which begin Sept. 11 at Seattle and Sept. 18 at San Jose.

What they propose is summarized thus: Change the code to raise the present branch circuit rating for residential occupancies from 15 to 20 amp. Wire with No. 12 instead of No. 14 but permit short taps of No. 14 from No. 12 circuits for individual outlets or switch loops. Permit general use of medium-base lampholders and 15-amp. receptacles on 20-amp. circuits. Raise the required watts per square foot from two to three. Require time-delay type of fuses and circuit breakers to allow for starting of motor-operated appliances.

The report also proposed a new design of plug fuse and adaptor that permits the use of ordinary fuses in the Edison-base fuseholder.

All of which recalls the long struggle in the West to obsolete No. 14 wire, which the late Earl Whitehorne called a "sacred cow." For more than 20 years the California home wiring standards, Red Seal and A-W, have outlawed it for convenience outlet circuits, requiring No. 12. The late Jerry Hill campaigned at a National Electrical Code meeting to have this recognized. The facts of life, he contended, have proved No. 14 obsolete.

Because the West has been years ahead in electric home usage it was foreseen years ago that No. 14 branch circuits were woefully inadequate. First came 1,000-watt and 1,350-watt electric heaters to demand more circuit capacity. Then followed 1,000-watt irons, toasters, table appliances; 500-watt and even 750-watt floor lamps. Motor starting and lamp inrush current demands have increased and made the ordinary 15-amp. fuse absurd. Even the non-tamperable sockets have been tampered with to make use of 20- and 30-amp. fuses on No. 14 circuits, safe or not (after inspection is over). For four editions of the code the mandatory requirement for non-tamperable or Type-S fuses has been demanded by inspectors and killed by EEI, a condition not conducive to intra industry harmony.

Now with this exhaustive study by EEI-AEIC as a factual guide, and if the problem will be approached without emotional bias, perhaps the National Electrical Code will be made to recognize some of the facts of load growth, appliance and lamp demand and what people do to their wiring, on their own.

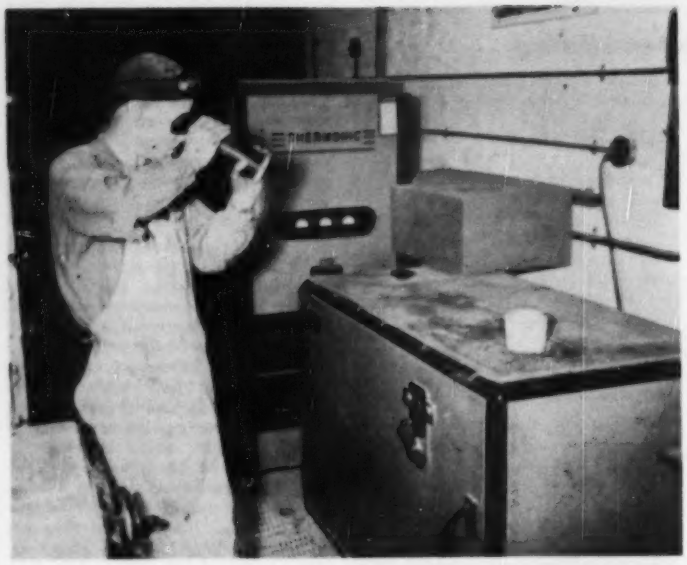
Even the physical objections to use of No. 12 have been minimized. With new wire insulations the over-all wire diameter has been reduced. Pressure-type contacts and larger screws in switches and receptacles make it easier to do the finish. Cost of No. 12, if used in volume, would soon be comparable with No. 14.

The history of the branch circuit has been one of increasing steps. Forty years ago the circuit was rated at 660 watts and fused at 6 amp. Then it was raised to 10 amp. In 1923 the code permitted an increase to 15 amp. and devices were improved for the higher amperage. By 1937 the code was changed to allow a 20-amp special-purpose circuit to the kitchen, dining room, laundry location. Field experience with this has been satisfactory.

Electrical inspectors, however, are not ready to accept this proposed change without a chance to discuss it. When it was presented to the correlating committee through the code-making panel the inspector members, particularly the two Westerners, L. W. Going and W. L. Gaffney, felt that inspectors had not had sufficient time to study the report or to satisfy themselves that the proposals would be safe. Going points out that the amount of heat that can develop in various parts of a circuit when over-current protection is raised from 15 to 20 amp. is raised by 78%. Portland's code, which requires double the number of branch circuits from those specified in the NECode, has shown the 15-amp. circuit to be satisfactory and induce little fuse tampering, he stated recently. Whether the flexible cord (No. 18) can be connected safely to a 20-amp. circuit is another question inspectors raise. EEI tests indicate that clock and tinsel cords are not protected on 15-amp. circuits either and that on 18 cord the 20-amp. fuse would open as quickly as a 15 on short circuit. EEI proposes that fuses and circuit breakers be modified in time-current characteristics to provide even better protection.

Because voltage drop (shades of Jerry Hill) is becoming increasingly important because of more heavily loaded circuits and motor-starting currents the larger copper size is also recommended. So is more use of 3-wire branch circuits in residential use. A 3-wire, 120/240-volt circuit for a given load will cut voltage drop in half and only three-fourths of the copper is required for equivalent circuit capacity. Where starting demands are great, 240-volt motors might be used oftener in home appliances such as automatic washers. Dryers now are a 240-volt device. Electric heaters too need 240 for adequate heating capacity.

It is to be hoped that this entire subject, so important to the still further electrification of the Western home, will be considered on its merits at the inspector conventions and not become fouled by prejudice or rancor. The question is an engineering one. Let it be decided on realities and facts by progressive and open-minded men.



High-frequency melting is being done here by this 40-kw. induction electric furnace

Electrical Energy in Precision Casting

"Investment" or "Lost Wax" casting process requires exactness of control met only by electric heating

L. B. REED

Industrial Heating Consultant
Los Angeles Department of Water & Power

MUCH is being written in the metal trades magazines these days about "investment" casting, or the "lost wax" process. It is, like radiant panel heating, something extremely new yet dating back many centuries. Invariably these articles mention that it was used by Cellini, the incomparable artist, in casting some of his masterpieces, and that it was principally used during the pre-war days for the manufacture of dentures. It also has been used for many years by jewelry manufacturers in making rings, costume jewelry, etc. And finally it came into its own, industrially, during the last war when it was discovered that small parts of intricate design could be cast, and because of their precision dimensions and smooth surfaces would require little if any machining or finishing.

Engineers in the industrial heating section of the Los Angeles Department of Water & Power became interested in "investment" casting when they were planning their booth for the Western Metals Exposition held in Los Angeles. The process was industrially new and few persons in the metal working trades seemed to know much about it, so arrangements were made to give actual demonstrations of the process in the department's booth. At the department's invitation, the Investment Casters Assn. of California cooperated in furnishing materials and equipment, and their chairman, Dick Ells, conducted the demonstration. The exhibit was an attention getter, educational, and offered an excellent opportunity to point out that it took electric energy to achieve precision and superior results.

The process, briefly stated, results in the production of a casting of undercut or intricate design and of critical dimensions. The first step is to make a die in which patterns of the piece to be cast may be formed in wax or other volatizing material. The die may be made from rubber if accurate dimensions are not required, or in metal dies where close tolerances are to be held. Molten wax is injected into the cavity, and a pattern of the desired casting is formed. These patterns are grouped together and are imbedded or "invested" in a refractory material, referred to as an "investment." The investment in a liquid state is poured around the pattern, allowed to harden, and then put through a heat cycle. This results in the melting or burning out of the expendable pattern and the preparation of the refractory mold to receive the molten metal. The metal is cast by centrifugal action, or other forceful means, so that the mold is completely filled and a strong dense casting is obtained. The refractory material is then broken away from the casting and cleaning operations are carried out.

The process seems to have first proved itself industrially during the war when it was used to cast turbo-supercharger buckets. The buckets were made of heat resistant alloys that were difficult, if not impossible, to forge or machine. Since then it has been used to cast many things in all kinds of metals. It has become of industrial importance because of its ability to produce large quantities of small parts, accurately and economically, from alloys difficult to fabricate by preexisting methods. Its advantages diminish as the size and weight of the part increase, and with metals that are readily fabricated by other processes. Where it is really valuable today, and which is one of the reasons we are so far advanced in our research of jet and rocket engines, is in the casting of complicated shapes and contours that are highly stressed at elevated temperatures. Many of the alloys used for this purpose are not machineable, and are strong and stiff at elevated temperatures, consequently forging is difficult and costly.

Users of Process

There are several investment casters in the Los Angeles area who are doing beautiful work. Of these, two are working with steel and the others with non-ferrous metals. California Precision Castings, and Centrifugal Investment Castings are the two working with steel, and doing the most exacting work. Centrifugal Investment Castings, for instance, is making one piece which has an odd shaped orifice with a dimension of approximately $\frac{3}{8}$ in. at the widest point in which the tolerance is minus 0.001 and plus

nothing. Both are working with high-temperature metals such as the Haynes Stellite X40, and are utilizing much electric equipment — California Precision Castings being 100% electric in its complete technique. Since the company is working on jobs that come into the "hush-hush" class, it is impossible to describe its accomplishments; needless to say they involve work on jet, rocket and turbo engines, and the parts are of difficult and of curvous contours, the dimensions of close tolerance, and the metals difficult, if not impossible, to machine or forge.

Accurate Temperature Control

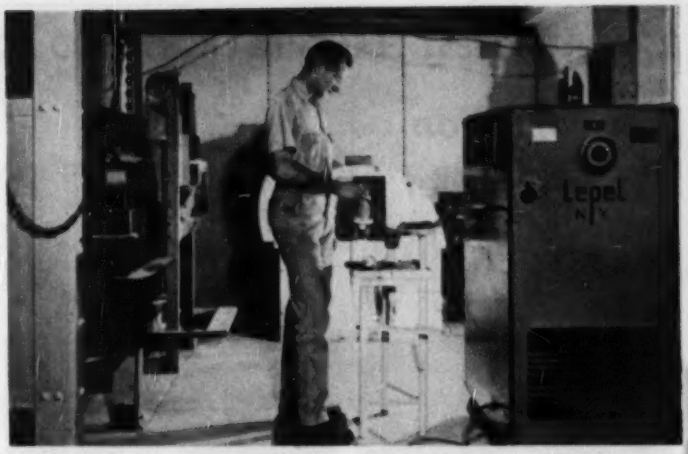
Parts that require extremely close tolerances can only be controlled by careful technique and the use of rigidly controlled materials and equipment. For instance, a technician working with a tolerance of plus or minus 0.002 in. has to contend with working factors like this: A variation of 15° in the temperature of the wax can account for a variation of more than 0.002 in. in a 3-in. dimension; in preheating the mold, a difference of 50° will cause a variation of 0.002 in. in a 3-in. dimension.

Since one of the greatest advantages of electric heat is the ease of accurate control, the use of electric heat for these operations should be mandatory. Another factor in keeping control of the final dimension of the casting is the temperature of the molten metal while being poured. With present-day methods of pouring, it is impossible to control the pouring temperature since there is a delay in getting the molten metal from the ladle to the mold. A difference of twenty degrees, plus or minus, will make a measurable variation in the final dimension of the casting. Electrical methods are now being developed to insure the metal's being at the correct temperature as it enters the mold.

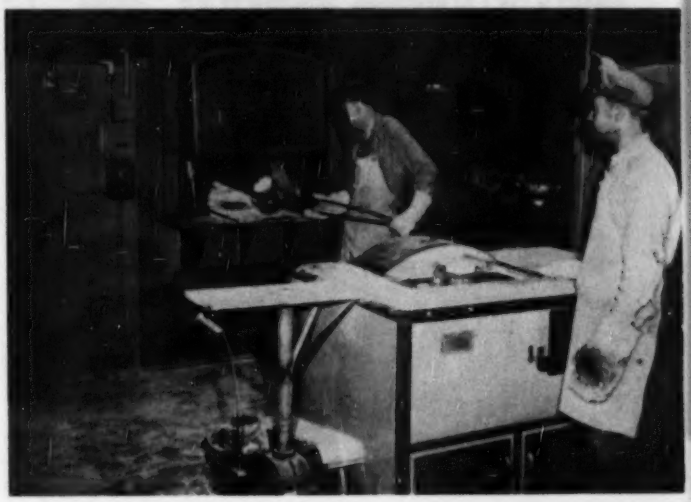
Further proof of the need for electric heat in obtaining extreme precision in casting is given in an editorial in the July 1949 issue of *Metal Progress* under the heading of "Some New Ideas About Foundry Work." The Navy's Bureau of Ships, and Bureau of Aeronautics have contracted the Alloy Engineering and Casting Co. to take the most ancient foundry art apart, and modify each of the fundamentals so that on reassembly "the operations would hardly be recognized by Biringuccio or Agricola."

The problem is how to make a well-designed casting in such a way that it will need no machining, retain maximum fatigue resistance, and will be accurate to shape after numerous runs at high temperature. The desired casting would be a clean casting of nickel-chromium-molybdenum alloy, highly accurate in dimension, with uniformly fine crystals and very smooth surfaces. Their research indicates that the ultra-foundry casting of the future will be obtained by considerable use of electric energy. The use of electric melting is a necessity with the kind of alloys suggested. Research so far has shown that the best molds are obtained by replacing the conventional molding sand with powdered refractory materials that are baked out by dielectric (radio frequency) heating. The method of pouring being tried utilizes an inductively heated graphite shroud tube with a ceramic lining. The metal is poured into a ceramic pouring basin from a bottom pour ladle, and passes through the heated pouring tube into a mold mounted on a turntable. The turntable, which also has facilities for high-frequency induction heating, spins the mold to obtain a centrifugal or centripedal casting. The induction heating in the turntable is used to induce heat into any desired part of the casting, either to slow down the crystallization rate, to keep a channel, or to keep a reservoir liquid.

Yes, it certainly takes electric energy to put precision into precision casting.



This 30-kw. Lepel unit is utilized by the Lawrence Laboratories for all of their melting

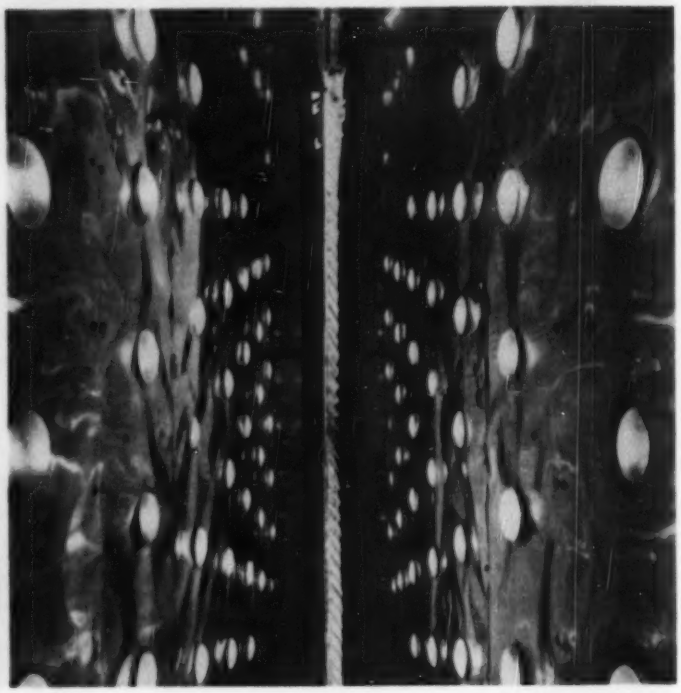


Electric furnace burns out expendable pattern and prepares mold for the molten metal

NORTHWEST ELECTRIC LIGHT AND POWER ASSOCIATION

Utilization Data Sheet No. 69

SUBJECT:	All-Electric Venetian Blind Laundry
CUSTOMER:	Weber Venetian Blind Laundry, Salt Lake City, Utah
TYPE OF BUSINESS:	Cleaning of Venetian Blinds
SERVICE COMPANY:	Utah Power & Light Co.
DATA SHEET PREPARED BY:	R. S. Frary



This plant is designed to clean all types of residential, commercial and industrial venetian blinds made of cloth, aluminum, steel or wood. The blinds are placed on a conveyor belt and subjected to a forced-spray, detergent bath, followed by a forced-spray rinse and drying in an infrared drying oven.

Under the former hand washing method the blinds had to be completely dismantled, the parts washed and dried separately, and then reassembled. This job took the full time of one man and consumed five times the man-hours required by the machine method.

Equipment

The new method utilizes three units:

1. Washer and Rinse: 5-hp. 3-phase, 240-volt, centrifugal pump blowing detergent through jets onto the blinds at rate of 750 gpm. Water is softened, used cold and recirculated. This is possible because cold water detergent, costing about $2 per 8-hour day, is used. Water is changed every 8 hours. Rinser uses water straight from the water main. Washer and rinser jets are located about 8 ft. apart.

2. Dryer: 108-250-watt, 115-volt, R40, industrial-type, infrared lamps offset in flat aluminum reflector. The reflector reduces radiation losses. Sixteen inches between bulb face and blind. Normal temperature is 125° F. Forced ventilation is not necessary; normal thermal draft ventilation is secured as a result of dryer design. Two lamps are connected in series across the 240-volt legs. Load connected in 3-phase delta.

3. Conveyor or belt driven by ⅓-hp. motor through gear reduction box at rate of 7½ ft. per min. Conveyor speed is variable to accommodate any conditions that may arise. Blinds are hung vertically from conveyor belt.

Advantages

1. One man operating machine and in spare time, taking orders, waiting on customers and repairing blinds, can do as many blinds in an 8-hour day as five men working full time, washing by hand.

2. Two-hour service using machine. Hand-washed blinds must dry overnight and consequently consume a lot of space. This also limits the process to an 8-hour day, unless a very large drying space is provided.

3. No hot water is needed.

Production Data

1. Machine can clean 250 ft. (in blind width) in an 8-hour day.

2. Wash and dry process is 90% effective: i.e., 10% are either so dirty that they have to be finished by hand, or are so long that they hang below the infrared band and are not dried.

3. Forty-eight feet from put-on to take-off; 82 minutes from put-on to take-off for one blind. After the first blind comes off, average rate of discharge is one every 4 minutes.

The whole unit is 62 ft. 6 in. long and weighs 12,000 lb. Washer and rinser is 190 in. long by 78 in. wide and is 126 in. high; infrared dryer is the same dimensions. Conveyor is 62 ft. 6 in. long.

Electric Operating Data

Connected Load: Infrared 108-250-watt, R40 lamps connected in 3-phase delta for a total of 27 kw.

Centrifugal pump 5-hp., 3-phase, 240-volt = 3.73 kw.; conveyor belt ⅓-hp., single-phase, 120-volt = 0.249 kw.; demand factor 100%; kwh. per month 4,800; usage 0.913 kwh. per foot of blind.

ELECTRICAL WEST Contractors' News Letter

QUICK NEWS ON TRENDS, LAWS, CODES, MATERIALS, EQUIPMENT, COSTS, WAGES, ETC.

Predicting is risky these troubled times when each day brings changed decisions to meet the Korean war crisis, so goodness knows what restrictions will have been clamped on before this is printed. As of Aug. 1 there were these certainties that contractors must reckon with:

No seers

The house wiring business is in a bind. Recent wage increases had already driven one prong into it. The President's order to tighten credit drove another. Then materials began to reflect the rising price of copper and steel, lead and zinc. Contractors caught with firm bids to finish already contracted jobs may have materials enough on hand. But anyone would be foolish not to allow ample margin for these higher costs in bidding any new work. So whether there is rationing or allocation of materials or wage freezes, the house wiring situation is losing ground.

Only a beachhead

Private commercial and industrial wiring is slowed by the same high costs. If there is considerable conversion to war industry this will make business in the future but manpower may also be siphoned away as it was before. The outlook is for more paperwork, more trouble getting materials.

Waiting to see

Public works, which constituted the bulk of new construction—new schools, public buildings, various city, state and federal government projects—may go on but with firm bids, cause contractors to lose. In bidding new projects the wage, efficiency, material and bookkeeping facts of life should be looked squarely in the face.

Can lose shirts

In one area in the Northwest housewiring employment was so poor among union electricians that there was talk of asking the employer group to discuss a lower scale to make them competitive with non-union electricians. Then came the Korean crisis and talk of wage freezing. So all bets were off.

Patriotic

Union politics prior to IBEW's biannual convention was made more drastic by re-election of Harry Van Arsdale as manager of New York's No. 3 by a big majority. IBEW president Dan Tracy had just found Local 3 guilty of discriminatory practices against electrical materials manufactured outside of New York. Van Arsdale was then suspended from office for three years but put on probation because of his efforts, it was said, to correct the practices. If indulged in by the contractors such practices would have landed them in jail for antitrust violation.

Another war

Ventura area scale was raised 15c an hour to $2.55, no vacation, in recent negotiations. It had been $2.40. Sacramento which had been $2.50 will increase 12½c the first of the year. In San Mateo County a strike was imminent as the local union demanded travel time pay in addition to a 12½c increase. Contra Costa County, which gave the union the same increase and vacation that Alameda County did, managed to get rid of travel expense in the bargain. Local 595 in Oakland and Alameda County branch of NECA were going to bury the hatchet at a "Friendship Dinner," Aug. 4.

Inflation notes

Veto of the basing point bill by President Truman leaves things up in the air for manufacturers (conduit for instance). Leaves it this way: An individual company ordinarily can absorb freight, but if several others in the same line absorb freight to the same market and the delivered prices turn out to be the same this can be taken as evidence of conspiracy. The FTC will decide if a special discount may injure competitors. Whether it can be given in "good faith" to meet competition is still before the Supreme Court.

Between horns

A move to suspend the copper import tax of 2c a pound is being rushed as the nation's needs for copper exceed its productive capacity. Government stockpiling is increasing so that you can't expect any decrease in price.

Copper tax

Lightolier has just issued a new consumer booklet titled, "How to light your way to a lovelier home." It shows use of modern Pacemaker lighting fixtures in lighting various rooms of a home. Sells at 25c.

Light

A brusque letter was written by FTC to someone who had asked what was the "accepted" ratio of cost to selling price. He was told that such advice violates the antitrust laws. Even warned that its was considered "agreement" if there is a meeting of minds with or without formal agreement or even if an understanding is reached through an intermediary. He was told to figure his own selling prices. **Roll your own**

Photoswitch Inc. of Cambridge announces a new line of photoelectric counting equipment and a bulletin PA-506 descriptive of it. The counter is a packaged set containing small housing for light source, cords and connections and the counter. Speed is up to 600 counts per minute. **It counts fast**

Filter-Facts is a little booklet put out by Barker & Williamson, Inc. to aid in curing television interference. Tells what does it, how to shield, filter and by-pass. Sells for 15c. **TVI cure**

San Francisco Electrical Contractors Assn. members did not give the required two-thirds majority to amendments required for raising dues from 1% of labor pay roll to 2% with a minimum of $10 monthly. The present dues recently reduced were found inadequate to operate the association, according to Emil Weber, who succeeded the late George Smith as treasurer. **Poor figurin'**

Pass & Seymour, makers of the Despard line of interchangeable wiring devices, now has an improved strap to hold them, called "Camstrap." Instead of crimping the fittings in the strap small cams lock them in place. They are easier to remove too without distorting the strap. **Lock**

Crouse-Hinds Co. is parrying the trend to trolley and bus feeders with ads showing how conduit and Condulets also provide a flexible system which has mechanical protection, safety, corrosion resistance and economy. **Fights back**

Benjamin Electric Mfg. Co. has brought out a new "Springlox" socket in its industrial lighting reflectors using the single pin slimline type of lamp. **Safe**

Refrigeration and Air Conditioning Contractors Assn. will hold its annual national convention this year at Long Beach, Nov. 15-16 together with a West Coast educational exhibit and conference. Neal S. Templin of Los Angeles is in charge of arrangements for the affair at the Lafayette Hotel. This association recently protested to the California Public Utilities Commission the selling of equipment by one of the gas companies. It also has before the Federal Trade Commission its charges against ice cream and frozen food manufacturers who give away cabinets to sell their products. **Outside competition**

People in the news: Lloyd Gates has been given a job Joe Rose used to have, that of handling all the contracts between Los Angeles Department of Water & Power and contractors and inspectors . . . Guy Don Stephens, graduating student of University of New Mexico, was awarded the Square D Co. Western division prize for the best paper on small air circuit breakers." Dan H. Miller of Los Angeles made the presentation . . . Ed Price, of Mare Island Navy Yard was elected president; Eugene Wilson, San Francisco Naval Shipyard, first vice-president; Lincoln Meany, Macy's, second vice-president and Stan Naistrom, Mare Island, secretary, of the Electrical Maintenance Engineers of Northern California recently . . . William H. Hogue, Larsen-Hogue Electric Co. Los Angeles was recently elected Region 14 director of National Industrial Service Assn. **Had you heard?**

Underwriters' Laboratories has bought ground, seven acres of it, at Scott Lane off El Camino Real, Santa Clara, where it will build a new and larger testing laboratory for electrical equipment. It has outgrown two locations in San Francisco, that on Commercial St. started in 1924, and the present one at 500 Sansome, into which it moved in 1938. **Elbow room**

An "Adequate Wiring Forum" is being programmed by the electrical contractors of Santa Clara, San Benito, Santa Cruz and Monterey Counties of California, Aug. 23, at San Jose. Sponsors are the local contractors association, PG and E, San Jose Division, NECA Western Regional Office, Northern California Electrical Bureau and Local Union 332, IBEW. **A new device**

"Sunrise House" near Los Gatos and San Jose has just closed after being on exhibit for nearly two months as an example of adequate home lighting and wiring. Over 30,000 people visited it. The builder was so pleased he put certified adequate wiring in all the houses of the tract, Blossom Hill Manor. Offered buyers of other houses the lighting features as an extra and sold several. Story on the whole thing next issue. **Sight for sore eyes**

ELECTRICAL WEST

Sales Guide

News Letter

FOR THE ELECTRICAL MERCHANT OF THE WEST

August 1950

Let the forecasters knock themselves out with predictions, the reality you as dealer or distributor have to face is this: The objective of the government will be to siphon off the public's money to pay for the fight and to keep the dollar worth something. That means increasing restrictions on credit and supply. For the public it means a lower standard of living. Now if a dealer or distributor can aim to operate efficiently on that low level he may be able to see it through. First casualty may be salesmen, so hard to get and train a bit ago. Then advertising and promotion, for some cutbacks have already been made. Present margins are based on volume sales so with increasing costs, that's where the squeeze will come first. Certainly nobody should give away any of this slim margin in discounts, deals or so-called volume-producers.

Back in the bind

By now the fever of buying has cooled off. It was largely "protective" buying by those who were almost ready to buy anyhow. It hit at a low inventory time when dealers were waiting for model changes and factories were on vacation schedules. Production for the rest of the year, though cut back some, may equal last year's. Many factories have decided to allocate again. Price rises have been few, mostly in TV sets.

"Fresh out"

Excise tax repeal is dead. Instead Congress is adding TV sets and home freezers to the list. There is a heavier income tax in the making (more subsidy to the co-ops) and a surplus profits tax, but with decreased volume and present margins fewer dealers will have any profit to tax. Things won't be "normal" again for a long time. The new "normal" will be to operate in a war economy.

And taxes

Fair Trade may have been saved by the bell. It had been taking a beating from discount houses, big New York stores, so many dealers, that the manufacturers couldn't police them all. Court cases take time and money. In Los Angeles, Sunbeam, Proctor and Westinghouse had brought suits in numerous cases. But the guerrilla tactics of violators were breaking the line in too many spots. Frigidaire and G-E removed Fair Trade from major items to the New York market. But with merchandise shortages in prospect shysters may up prices now.

Like Korea

Television scamnings: Hoffman Radio & Television has made a unique deal to sponsor college football videocasts this fall by guaranteeing USC, UC, Stanford and Washington a box office minimum for each of a total of 30 home games. H. L. Hoffman takes a maximum risk of $350,000. Stations are signed up on a sliding scale. Time costs will go up if

TV news

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Hoffman doesn't have to pay colleges the differences. Everybody in the deal promises to promote attendance—the schools for color and school spirit, stations to earn a higher rate, newspapers their own interests in TV stations and Hoffman. . . The color question is promised to be settled this fall by FCC but just as it closed testimony General Electric entered the race with a new system on a band no wider than black and white, called frequency interlace, and says it can be used with either the 3-tube or single picture tube systems of others. . . Zenith asked for and finally got an extension to Oct. 1 to make its Phonevision test. . . Warner Bros. has about decided to enter production of films for TV. It is also experimenting with large screen TV for theaters. . . Price increases were announced by DuMont, which signed up the rest of its year's production at a recent distributors meeting. Walt Stickel, sm, made the announcement, attributing cost increases and component shortages. . . Emerson also announced price increases. . . But Siracuse of Admiral denounced price increases. . . Westinghouse sold 607 TV sets to builder Bechtel Co. to install in all homes of the Taraytown Village tract in Oakland through Nick's Electrical Living Shop, Berkeley. They'll be built in.

"What's Ahead in TV" is pretty much in the hands of the Kremlin and the Pentagon, Al Meyer, Leo J. Meyberg Co., told the radio, television and appliance dinner at Western Merchandise Mart's market week, San Francisco, July 26. He felt that TV sets would continue to flow for some months to come. But after straight-arming with some astounding facts about the growth of TV, despite some of the most negative obstacles any business ever had to face, Meyer declared it the greatest moving of a new commodity in history and still destined to grow.

John R. Hurley, Thor Corp. president, discarded his pre-Korea talk and gave his views of the lowdown: It is a longer war than we think. It will affect the economy longer. Civilian goods must suffer to whatever extent war materials are needed. There will be price increases because costs will rise. Breakeven is four times higher. Dealers should: Get substantial down payments; concentrate on fewer lines and learn to sell them better; sell more ironers, they take less steel. There's no reason for panic buying. All can count on at least six months' warning before plants can be converted.

E. J. Buchanan, Frigidaire Pacific regional manager, as dinner chairman, left some good advice to all. "Let us count our blessings. We are still in business. You are still getting goods. It may not be in the proportions you'd like but you are getting goods. Let's protect our organizations. Let's keep intelligent personnel to deal with our customers well."

Among new things to be seen during Market Week were few outright novelties. Mostly they were refinements of models or new lines introduced but not radically different. Along this page are pictured a few: 1. Hydro-Magic dryer, shown by O. B. Wilt, a 10-cu.ft. rack dryer, 110-volt, 1500 watt, counter high, with convenience outlet for use when dryer isn't running. 2. Thermador's new electric range model with built-in griddle, two ovens, four burners. 3. Hotpoint's restyled automatic clothes washer with

added refinements. 4. Drittell Electric Table, in colors, counter high, with cord and safety convenience outlet, shown by Clyde Allen Co., also Manning Bowman's new automatic coffee urn. 5. Astral refrigerator, office size for doctors, syrums, etc., operating without moving parts, electrically, hence no fumes, on heat exchange principle; shown by Thompson-Holmes. 6. Philco's remote controled TV set with long cord to your armchair to switch stations, adjust intensity, etc.

Out front

Other new things were: Frost-Pak refrigerator for offices in moderne black or ivory; Orlay freezers with directions and inventory in porcelain on the lid—shown by Paul Rice. . . Natalie Kalmus styled TV sets made by Richmond Colorvision Corp. of L. A. . . The Murray line of ranges and kitchen cabinets shown by Thompson-Diggs Co. . . Westinghouse's new color dial range controls and superspeed burner that puts 5 kw. into it until it comes up to heat in a few seconds. . . Apex portable and fully automatic dishwasher. . . Talatone TV sets clothed in western-made cabinets for this market and with a flexible pricing system to meet conditions. . . Perfectionaire compact apartment kitchen with Thermador range, shown by George Hall. Courac TV sets and chassis for building in, shown by Clyde Allen Co. . . Lazyhonas, the Zenith feature for remote control of all its 1950 TV sets. . . Packard-Bell with a full range of new TV and combination models. . . New electric ranges by gas range makers—Florence and Tappan. . . Ingenious Signal floor polisher, sander, drill rig, and also the New Lectro Paint Sealer, shown by Fred Wood Co. . . And Frigidaire's mechanical gadgets that cut a refrigerator in half and showed how it was made, and did the same with the electric range—exceptional display pieces.

Covers more

El Paso territory for Deepfreeze distribution has also been given to Boyd Co. of Denver which will handle it out of its Albuquerque branch and later establish a branch in El Paso, according to Bob Harnish, Deepfreeze regional manager. In Salt Lake City the Deepfreeze line will now be handled by Mountain States Distributors, of which Ernest Prichett is president. Carlos Stone will become sales manager. This distributor also handles Packard-Bell, Capitol Records and ABC washers.

TV gamut

Zenith distributors, such as H. R. Basford Co. in San Francisco, etc., have been holding dealer showings of the new 1951 line, with bigger picture tubes, round ones and square ones for those who want 'em, or square pictures on round ones, and the feature attraction, Lazyhonas, a remote control push button on a long cord by which to switch stations from your easy chair. Also showed new phonograph combinations with the Cobramatic three-speed, single-cartridge pickup and any speed turntable from 16 to over 78.

Quick news

Briefer briefs—Thompson-Diggs Co. now has distribution of Blackstone home laundry equipment for northern California. . . Northern California Electrical Bureau cancelled its home freezer campaign when the war cleared out stocks, but the big Electrical Wonderland Exposition is definitely going on. . . Leo J. Meyberg Co. moved into spacious new building of its own at 33 So. Gough St., San Francisco (details later). John Hurley, president of Thor, was on hand when John Gunderson, Western division manager, and Paul Chalfant, L. A. district manager, held open house for the new offices at 1440 West Olympic Blvd. Thor no longer assembles at El Monte. . . Utah Power & Light Co. has just issued two sales help booklets on how to sell electric cooking and water heating. . . York Corp. may soon have a packaged home air conditioning system to sell at around $1000. . . John L. Busey, onetime Westerner

who was with Pacific States Electric and G-E Supply in Montana and California and became president of G-E Supply, has now been made a G-E vice-president in charge of marketing. . . Instead of cutting price on its line of Everhot appliances, Swartzbaugh Mfg. Co. increased dealer margin to make it worthwhile selling. . . Servel and some merchandising gas companies have been indicted for alleged conspiracy to fix gas refrigerator prices in 4-state market. Servel was also sued by Justice Dept. for alleged monopoly of gas refrigeration equipment. Just as it was bringing out a combined heating and cooling house air conditioning package. . . Nasco has also shortened its name to its trademark.

Packard-Bell has appointed two new distributors, John E. Amberg for San Francisco, and A. R. Bell, Oakland. — Two more

TV figures: San Francisco area reported June TV sales at 2,382, bringing the total sales to date 59,652. . . Los Angeles total for June was 33,207, boosting total sales to 596,673. — Climbing

John M. Tonner, Western regional manager of Norge for the past five years, has been made Norge's refrigeration sales manager. R. H. Pinor, for the past three years Eastern regional sales manager, is the new Western regional sm., with headquarters in San Francisco. — Changes

Radio Manufacturers Assn. is changing its name to Radio-Television Manufacturers Assn. — RTMA

DuMont has patented a three-color direct-view TV tube which can be used in any one of the three color systems now before FCC. Tube is similar to the black-white one, except for a new kind of fluorescent screen. — Three color patent

Robert H. DuWalt is the new sales manager of the Western region for Proctor, with offices in Los Angeles. He joined Proctor in 1940; served recently as district manager of the Kansas City territory. — Western sm.

Electric fan sales kit is offered to dealers by NEMA. Includes two copies of the manual "Fans for Year 'Round Comfort," 50 copies of a 4-page consumer folder, "Electric Fans for your Comfort," plus explanations of new uses for fans. Available for $1 from Electric Fan Section of National Electrical Manufacturers Assn., 155 E. 44th St., New York 17. — Fan kit

Mitchell has an integrated floor and table lamp department for its lamp line. Uses only 10 ft. of space, complete with merchandise display and assortment of both floor and table lamps. — Lamp display

Westinghouse is giving its laundry equipment dealers a new 44-page booklet emphasizing the demonstrate-to-sell theme. Has detailed plans for giving store and home parties with the use of ads, displays, direct-mail pieces. — Helps

Hotpoint's new "glamour-line catalog" of commercial cooking equipment is available to utilities, Hotpoint distributors and dealers now. Price is 60¢ each. Utilities and dealers should order from Hotpoint distributors. — glamour

MARJORIE HARPER, PCEA home economics committee chairman and district home economist of General Electric Co., in a talk at the Pacific Coast Electrical Assn. convention, tells

How To Make A Demonstration Work

She maintains a demonstration is the best way to sell electrical appliances. Study and apply her four-step formula and make it work for you

Step I — Analysis

Advance Planning

1. Is it timely? Timing a promotion is all important—according to seasons, general thinking of the people, the times and conditions throughout the country. (Should follow the habits of the public).

2. Does it conform to the season of the year? Seasons have every element for a promotion—planning your home, dress up for spring, back to school, holiday entertaining.

3. Should the promotion carry one appliance or several?

4. What type of promotion should be offered? It should be designed to appeal to the people of a community —home owners, those renting, and in the price bracket.

5. Who is sponsoring program?

How to Promote

1. One minute preview movie trailers with a selling message on the appliances and telling the public about the program.

2. TV trailers with activity pictures or local people to introduce the coming program.

3. Newspaper advertising, especially the community newspapers that are usually published on Thursday for the weekend specials.

4. Radio announcements.

5. Circulars.

6. Window cards and displays.

7. Cooperation with utility companies.

How to Develop Prospects

1. Send invitation cards to new users and ask them to bring a friend or relative. If demonstration is to be in evening be sure to bring husband.

2. Send cards to prospects from your card files—prospects from utility company.

3. Personal contact by salesmen.

4. Telephone reminder to prospects the day preceding demonstration.

5. Run an ad in newspaper advertising program.

Blueprint for Demonstration

1. Make a check list of the necessary advance arrangements to be discussed. This will assure the success of the program. This should be made in duplicate—one copy for the home economist, one copy to be retained by the dealer.

2. Make a list of the price to be stressed by the home economist on product information and features of the appliance or appliances to be demonstrated.

Step II — Check List

In questionnaire form, the check list should include the type of demonstration, the name of the dealer and home economist, and the following information:

Advance Arrangements

1. Who is sponsoring program?

2. Date. Be sure that it does not conflict with other special events or community activities. Generally speaking, Tuesday, Wednesday and Thursday are the best days of week for a cooking school.

3. Number of days.
4. Time for opening and length of program.
5. Place, seating capacity, address, telephone number.

Appliances to be Used

1. Range. What model? Will one or two ranges be used? Will the range be connected the day before program? Is it level? Is it clean and in good condition? Are all the parts and accessories on the range—pressure cooker, broiler pan, switches, etc?

2. Refrigerator. What model? Will it be connected the day before the program? Is it clean and in good condition?

3. Electric sink. Will one be connected and operating properly? If not, is a portable dishwasher available? Will it be checked for proper operation? If not, is there a sink and running water for preparation and clean up?

Equipment Necessary

1. Is counter space for preparation available?

2. Will two work tables be available, one for demonstration, one for display of foods prepared? (Size—approximately 30x40).

3. If demonstration is for a large group, is it possible for you to have a mirror (10x15 or larger) held at an angle over the table?

4. If demonstration is to be held in an auditorium or theater, will you arrange for a public address system, preferably a lapel "mike?"

5. Are chairs available to accommodate the group? How many? Who will be responsible for getting them?

6. Will movies be shown? If so, what? Who will run the movie?

Market Order

1. Who will furnish groceries and order them?

2. Is there an approximate cost bracket?

3. Who will help clean up?

Door Prizes

1. Will food be given as door prizes?

2. Will other prizes be given away?

3. Who will handle the drawing?

4. Are containers available to give food away in?

Publicity

1. Will advertising appear in advance of the meeting? How many, what size, newspaper, radio, posters and window cards, direct mail.

2. Will your salesmen invite prospects? By personal contact, telephone, from card files, new users, kitchen prospects, those secured from utility.

3. Do you want home economist's picture for publicity?

Promotional Material

1. What promotional pieces are to be given away? How many?

Opening and Closing

1. Who will be on hand to open program and welcome guests?

2. Will he also close program?

3. Will salesmen be present to answer questions and write orders?

The check list should be signed by the dealer, with his address, telephone number, and the name of the sales counselor.

Step III — Prospect Card

To develop prospects and convert them into purchasers, prospect cards should be distributed during the demonstration. After it is over the dealer has the names, addresses and a friendly acquaintance with a group of real prospects, not only for one appliance, but others as well.

Your Name ..... Phone .....

Street Address ..... City .....

PLEASE ANSWER THE FOLLOWING:

1. Is your home wired for an electric range or electric water heater?
   Yes ..... No .....
2. In what type of home do you live?
   Single .... Duplex .... Apartment ....
3. What is the make and approximate age of your:

Range	.....	Years
Refrigerator	.....	Years
Washer	.....	Years
Water heater	.....	Years

4. What is the next electric appliance you expect to own?

Electric range	.....
Electric water heater	.....
Electric dishwasher	.....
Garbage Disposal unit	.....
Complete electric sink	.....
Automatic washer	.....
Wringer washer	.....
Electric clothes dryer	.....
Flatplate ironer	.....
Rotary ironer	.....
Electric refrigerator	.....
Home freezer	.....

Step IV — Suggested Demonstrations

The following suggestions for stores, fairs, schools, etc., are easily prepared and effective for demonstration use. In many cases it is easy to tie in the various appliances with one food. Freezers and ranges seem to be a natural combination because frozen food must be cooked on the range.

1. Frozen meal. Baked fish filets with mushroom sauce, frozen cherry cobbler, frozen baked corn. This meal using frozen fish, cherries and corn can be done effectively in the oven in 45 minutes, showing the use of frozen foods with partial thawing or no thawing at all.

2. Creamed shrimp or frozen chicken a la king. To be served on frozen bread or waffles directly from the freezer and toasted in an automatic toaster.

3. Frosty fruit cup. Using a combination of frozen and fresh fruit and with a latitude for substitution.

4. Chocolate crispies. A quick cookie that can be made in 20 minutes. Shows controlled speeds, use of right rear unit, melting chocolate, and oven baking performance.

5. Quick chocolate frosting. Using candy bars or chocolate mints on cupcakes hot from range oven.

6. Chocolate mint sauce. Right rear unit and controlled heats—simple and easy. Made from chocolate mints.

7. Celery seed bread. Quick and delicious way to fix unsliced bread using range.

8. Packaged cake or gingercake mixes baked in small paper cups to show baking and browning in oven.

Following suggestions are easily prepared; effective for demonstration:

Oven

1. Cookies. Cookie mixes or frozen rolls that may be sliced and baked, variations of refrigerator cookies, date pinwheels, drop cookies—rice krispie and chocolate or marshmallow combinations, cookies baked in a sheet and cut in squares—chocolate crispies and brownies.

2. Upside down cakes. Has its own topping. May make for display or cut in small squares to serve.

3. Quick breads. Nut breads and variations.

4. Cheese straws.

Broiling

1. Hot snacks. Deviled ham or cheese rolled in bread cut from a sandwich loaf so that small pieces may be broiled, frankfurters rolled with bacon, cut for serving, a toothpick in each.

Surface Cooking

1. One dish meal. Ground meat, beans and spaghetti and variations.

Suggestions for demonstration of home freezers in stores, fairs, schools:

1. Luncheon from home freezer to range to table. Soup (quick thawing and heating), bread (frozen) toasted—set toaster "dark."

2. Frosting fruit salad plate. Illustrating refrigerator and home freezer.

3. Strawberry ice cream soda. Using part of a package of frozen fruit, ice cream (economy of large-quantity purchase), soda (illustrating the tall bottle storage in refrigerator and ice cube release).

4. Frozen orange juice. Feature ease of preparation, year-round quality, cost, convenience—less shopping trips with a home freezer. Make orange juice using mixer. Make frosted orange juice with ice cream.

5. Show boxes of baked cookies—these may be served in ten minutes or less.

6. Canapes—give entertaining suggestions. Prepreparation for parties may be made two weeks in advance.

7. Method for quick thawing of fruit. Place in bowl containing warm water for ten minutes. Add more warm water. Open and serve.

"Electrical Wonderland" Show to Go On

War or no, the electrical industry of San Francisco region is going ahead with its Electrical Wonderland Exposition, Sept. 23 - Oct. 1, in San Francisco's Civic Auditorium. All preparations having been made, the exhibitors having arranged for their displays and the industry needing this boost to public acceptance, the show will go on. And it will be quite a show!

Finest entertainment from the radio and television field will be featured each day as public attractions. Programs will be broadcast and telecast twice daily from the stage. A Wonderland Theater will present industry feature shows besides. Such spectacular things as the Westinghouse Mechanical Man; the General Electric talking refrigerator, the Junior; Frigidaire's Mechanized Models; and the Bodyless Woman who answers Adequate Wiring Questions; the General Motors show; Westinghouse Atomic Show and others will be featured.

In Polk Hall, the "Hall of Light," the famous Thomas A. Edison Exhibit owned by Ward Harris, and Edison's original automobile, will prove a historical exhibit more than usually attractive to school groups and the public. The exposition will be advertised by a $50,000 campaign, half of which will be carried by Pacific Gas and Electric Co. in the newspapers of the region, half by the Northern California Electrical Bureau, sponsor of the exposition, for billboard, streetcar and radio ads. Mayor Robinson has proclaimed the show period "Electrical Living Week."

At press time more than 80% of the main auditorium space had been signed for, 70% of the Hall of Light and 55% of Larkin Hall, according to LeRoy Bennett, manager, Northern California Electrical Bureau. The exhibitors at press time are listed on this page.

Exhibitors at Press Time

Allen & Olson
American Broadcasting Co.
Aronson, Will M.
Basford, H. R. Co.
Black & Decker
Delco Appliance Co.
Delta Power Tools
Easy Washing Machine Corp.
Economy Sewing Machine
Frank Edwards Co.
Electrolux Corp.
Electronic Door Control
Filter Queen Co.
Federal Electric Products Co.
Fluorescent Fixtures of California
Frigidaire Sales Corp.
General Appliance Co.
General Electric Co. Apparatus Div.
General Electric Co. Lamp Div.
General Electric Supply Corp.
General Sales Corp.
Given Manufacturing Co.
Gray, Geo. A.
Graybar Electric Co.
Hamilton, C. G. Co.
Hoffman Sales Corp.
Holzmueller, J. C. Co.
The Hoover Co.
Incandescent Supply Co.
International Brotherhood of Electrical Workers
Kaemper & Barrett Dlrs. Supply Co.
Kelvinator Div. Nash-Kelvinator Sales Corp.
KRON-TV Chronicle
Lancaster, W. J. Co.
Lavenson & Savasta Co.
Malleable Iron Range Co.
McCormack & Co.
Meier Co.
Mission Appliance Co.
Moore & Rowe Sewing Machine Co.
Motorola, Inc.
Meyberg, Leo J. Co.
Mercury Television & Radio Corp.
Noma Electric Corp.
Northern Calif. Electrical Bureau
Pacific Gas and Electric Co.
Pacific Telephone & Telegraph Co.
Panama Lamp & Commercial Co.
Perfection Stove Co.
Pioneer Appliance Co.
Pressteel Co.
Radiant Glass Heating Corp.
Relaxicizor Thermatone, Inc.
Roberson, N. L. Co.
S. F. Electrical Contractors Assn. Inc.
Sears-Roebuck & Co.
Sherman Clay & Co.
Skilsaw Inc.
Sylvania Electrical Products Co.
Stover, Bessie T.
Sunbeam Corp.
Tappan Stove Co.
Thompson & Holmes Ltd.
Transvision of California
Thomson-Diggs Co.
Wesix Electric Heater Co.
Westinghouse Electric Corp. Lamp Div.
Westinghouse Electric Supply Co.
Wilkins Distributing Co.

Seattle Wiring Policy

In an effort to modernize homes in the Seattle area, Seattle City Light is providing the wiring for an electric range and the wiring and plumbing for an electric tank water heater (50 gal. or larger) at a cost of $30 to its customers. Homes already wired for an electric range are entitled to wiring and plumbing of an electric water heater without charge. Cost of installation in duplex homes is figured on request. New residence construction is not included in this offer.

On buying an electric range and water heater the customer is instructed to contact City Light for the installation of the equipment. City Light then dispatches an electric contractor wireman and licensed plumber to do the work.

ELECTRICAL WEST

War Is Hell

IN the first glum weeks of the Korean war it was only natural that there should be confusion throughout the electrical industry as to the effect of this sudden international upheaval on the industry's future. But as the nation began to mobilize for this emergency and for any crisis that might follow, the industry's path was clearer—another shirt-sleeves job of contributing to an ultimate victory. And it has an excellent pattern to follow: its outstanding performance in the 1941-46 war years.

Several aspects of the mobilization program will affect all branches of the industry. Material allocations and priorities, higher taxes and manpower shortages will plague everybody—utility, manufacturer, distributor, contractor and dealer. Any economic controls must mean revisions of individual plans and programs for the future.

Power companies will feel the war impact from several other directions. Financing problems will be more difficult because the stock market reaction to war has raised interest rates. Future construction programs will have to be reviewed in the light of possible material and equipment allocations. Although schedules for new capacity additions are high, they might well be studied to insure that they are adequate. Total load will rise, although there are sure to be some shifts. Residential growth will taper off as appliance supplies diminish and home building slows down. However, new industrial load will more than take up any slack.

Electrical manufacturers know war's pattern. Their shift from the products of peace to the weapons of war will follow a familiar schedule which is not without troublesome problems. For distributors and dealers war, if it lasts long or if its tempo and scale should build up, could mean virtual liquidation of the gains made in the last four years. However, an initial $10 billion war material program will not shut off all supplies of appliances. The job here would appear to be one of preventing another inflationary price spiral. Credit limitations and material shortages might bring the residential building boom to a virtual standstill. Hence contractors who have relied upon this field for their business must look elsewhere. But industrial construction will offset some of this business loss. Incidentally so too will any rehabilitation of wartime shipping, since experience to date has proved that shipboard electrical installations on the mothball fleets must be largely replaced.

This brief lineup of the industry's war outlook warrants two observations: First our industry is competent to handle its new wartime responsibilities capably and efficiently. We can be sure that once again there will be no "too little nor too late." The second is that Sherman was right: "War IS hell."

Regulating the Rain

EVER since the first drop of rain fell from the first cloud seeded with dry ice from a flying plane there has been an increasing likelihood that artificial rain-making would come under government control. Now that the technique is a demonstrated success as a means of increasing precipitation in the arid West, control promises to become a fact. The California Water Resources Board is preparing legislation to license rainmakers. And Arizona legislators are studying possible regulatory laws. The next move will be for the FPC to take over on a national scale. After all rainfall does affect navigation.

Labor Has Learned a Lesson

SEVERAL straws in the wind do not always mark a trend. However, there is every reason to believe, in the light of recent events, that organized labor is becoming increasingly cognizant of the stake it has in private ownership. At least both the CIO and AFL unions representing utility workers have come out vehemently against further encroachment of the federal government in the field of electric power.

At its spring convention the CIO Utility Workers Union of America adopted a report condemning the "creeping paralysis of nationalization" of the light and power industry. "The government is already in the utility business to quite an extent and, unless we are on our guard, will soon own most of it," the report said. "This will be the first step down the so-

EDITORIAL VIEWS

cialist highway. Then transportation, communication, steel and the rest will follow to put an end to our American way of life."

The IBEW executive council has endorsed recent statements by IBEW President Dan Tracy condemning government expansion of electric power operations. The council statement says the government power program is a "plan involving what could well be, and assumes all the aspects of, the first step in the evolution of governmental ownership of the generation, transmission and sale of electricity to the individual consumers."

What these unions have found out to their sorrow is that when federal agencies move in to take over, the rights and privileges of the organized union worker go out. It was ever thus under any system of socialism.

Perhaps these two great electrical unions can convince others that they too have much to lose if private ownership loses its fight.

Socialism Is Like Polio

NOT many Westerners had an opportunity to hear Dr. Christopher Daniels, an eminent British physician, tell why "Socialism Is Like Polio." Extracts from his matter-of-fact discussion, which moved some two hundred members of the San Francisco Electric Club as few talks ever have, are printed as the leader in this issue. We commend it to those cynics and those complacent individuals who insist that such things "cannot happen here." The cogency of Dr. Daniels' arguments for the preservation of freedom and enterprise and opportunity have a special meaning now when this country once again is about to become burdened with governmental controls impelled by another war.

The compelling story of this English doctor who is seeking in America the freedoms that he had to forsake under socialistic regimentation has a particular significance as this is written. For in the editor's mail there was a letter from a young British engineer seeking information about opportunities in America which he feels are denied to him under a socialistic regime. So he would come here to find freedom and opportunity. As we reread Dr. Daniels' arguments we wonder if the day will come when America's sons will have to look to some other part of the world to find the liberty and opportunity guaranteed to them today.

Lighter on the Inside

DECORATORS and some arty architects have been putting over a "subversive" style trend on the gullible women of America—the dark, gloomy interior.

The one lone voice raised in this new wilderness of gloomy greens and deep purples in which the bullet-shaped spotlight alone glares and dim glimmers ooze out from beneath huge festooned bushels called "lamps"—the lone voice for sane interior lighting here in the West recently has been the *Sunrise House* exhibit at Los Gatos. There the Northern California Electrical Bureau persuaded the builder and finally the electrical contractor to make at least one home of a new tract a model one with adequate lighting and wiring. *Sunset* Magazine also entered into the plan and has featured the home in its August issue. Now several other homes in the tract are to be as well lighted.

With surprise *Sunset* says that when its photographer arrived with all his extra lights and equipment to take pictures he found he did not need them. The pictures were taken by the light of the installation alone. This admission by the home magazine confirms an opinion that the pretty colored interiors as seen in the magazines are not that way in reality.

Such interiors may well be designed to make the home as attractive as the cocktail bar for entertainment of guests but something should be done to train the occupants to read by Braille.

I AM well aware of the toil and blood and treasure it will cost us to maintain this declaration. Through all the gloom I can see the rays of ravishing light and glory. I can see that the end is more than worth all the means. And that posterity will triumph in that day's transaction, even although we should rue it, which I trust in God we shall not.—John Adams, 1776.

Northwest Association Elects Officers; Changes Set Up

Thomas W. Delzell, chairman of the board of directors of Portland General Electric Co., was elected president of the Northwest Electric Light & Power Assn. at its annual meeting in Portland, July 17. He succeeds Howard N. Walters, B. C. Electric Co., who held the office during the past year.

Under a change of organization which abolished the state vice-presidents formerly elected by the association, two vice-presidents were elected as follows: first vice-president, A. S. Cummins, president of the California Oregon Power Co., Medford, Ore., and second vice-president, J. E. Corette Jr., vice-president of the Montana Power Co., Butte.

The change in organization provides for an enlarged board of directors on which each member utility company will appoint one representative, with a smaller executive committee from the board consisting of association officers and immediate past president. This group will conduct the business of the organization between board meetings.

Elected to the board to represent the manufacturers, wholesalers, contractors and retail dealers were: John Gogin, General Electric Co., Portland; J. Colin Smith, Aluminum Co. of America, Seattle; John P. Lawton, Graybar Electric Co., Seattle; T. C. Clarke, Northern Electric Co., Vancouver, B.C.; Henry Holert, Holert Electric Co., Seattle; H. N. Crandall, Crandall Electric Co., The Dalles, Ore.; Raymond L. Gray, Eastern Oregon Electric Co., La Grande, Ore., and Harold D. Lent, electrical dealer of Bremerton, Wash.

In accepting the presidency of the association for the coming year, Delzell said that his program would include a maximum exchange of information and ideas between all parts of the Pacific Northwest power industry to promote the highest degree of service to the public. In referring to the over-all problem of relationship with governmental power agencies, he expressed the hope that "common denominators" could be found that would produce a greater degree of political as well as operating unity in working out this region's problems in resource development and public service through the existing combination of electric utility companies, local public enterprises and federal agencies.

Walters reported a year of unusual achievement for the electrical industry in the territory, in which the member utility companies of the association had brought in 344,500 kw. of new generating capacity. These companies have spent in the approximate four years from V-J Day to December 31, 1949, more than $276,000,000 in additions and improvements to their properties, he said.

Delzell

Berkeley Snow, Portland, was reappointed executive secretary of the association.

Section Meeting

With two top speakers from outside the accounting profession, and a number of reports and discussions on new methods and procedures now being used among member companies, the Accounting & Business Practice Section of the Northwest Electric Light & Power Assn. held its annual section conference in Portland, June 22 and 23. E. W. Bredemeier, Portland General Electric Co., was chairman, while Roy L. Nelson of that company headed the committee on arrangements. Attendance of 111 was the largest in several years.

Recommended Federal Power Policy

Thomas W. Delzell, chairman of the board of directors of Portland General Electric Co., one of the principal speakers, laid down six principles of a federal power policy that would make for a more equitable distribution of public service from federal power projects and private and public distributing agencies and a more efficient development of the region's natural resources.

1. The federal government should participate in electric power production only in connection with works for improvement of navigation, control of floods and reclamation of arid lands. All projects not involved in such benefits should be left to states, municipalities and private companies, and these groups also should have prior opportunity to develop such parts of multiple-purpose projects as they can.

2. The federal government's responsibility for marketing the power from multiple-purpose projects should include construction and acquirement of only such transmission lines and related facilities as are necessary to interconnect projects in accordance with sound engineering and business principles. Sales to industry should be confined to those able to take service in large quantities direct from the federal system and unable to secure adequate service from the public and municipal utilities.

3. Federal power marketing agencies should have no powers to regulate others as in some respects is now the case. Rather they should themselves be regulated by an independent and impartial arm of the government such as the Federal Power Commission.

4. The powers of the regulatory arm should include the licensing of both the federal and non-federal generating installations; the determination of the public convenience and necessity for transmission lines; the supervision of accounts in accordance with law and standard regulatory practices; approval of rates and tariffs; and enforcement of reasonable and nondiscriminatory standards of service.

5. There should be no subsidization. Rates from federal projects should be sufficient to cover the cost of maintenance and operation, interest, amortization of capital investment, cost of interim replacement; amortization of capital costs not allocable to power; and taxation or payments in lieu thereof.

6. Present preference and priority provision in federal laws pertaining to power should be amended so that there would be an equitable distribution of this power among the several states within the river basin. Regulated private utilities should have preference in power contracts ahead of large industrial users.

Another main speaker was Ernest G. Swigert, president of Hyster Co. of Portland, and regional vice-president of National Association of Manufacturers, who gave many illustrations of how the growth of centralized

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government and bureaucratic control was encroaching on our liberties and sapping the strength of our free enterprise system. He urged that all citizens exert a sharp vigilance and an increasing interest in government and politics.

The accounting conference proper led off with a report by member company representatives on changes and innovations in procedures and equipment. The change from oak to steel furniture in offices of B. C. Electric Co., Vancouver, was said to better working conditions and to improve employee morale and production. Quick reproduction of reports and the saving of time of stenographers had been accomplished by photostating equipment formerly used only for maps and engineering work in the California Oregon Power Co. That company has microfilmed more than 1,000,000 items, saving filing and storage space. California-Pacific Utilities Co. has gone to centralized billing with IBM equipment. Idaho Power Co. has set up a unit classification for substations for plant accounting. Montana Power Co.'s postcard billing is proving a great money saver. This process has been adopted by Mountain States Power Co. and a comparable saving in cost was reported. Puget Sound Power & Light Co.'s changes had been chiefly in new accounting machines. The company retains bimonthly billing adopted during the war. Utah Power & Light Co. contemplates some short cuts in stores accounting. Washington Water Power Co. is studying pay roll procedures, stores accounting and is using postcard billing.

Ralph W. Lawlor, Pacific Power & Light Co., described the change in his company's centralized billing section from addressograph plates to Elliott stencils, and from Burroughs billing machines to NCR machines. Twenty-two people are required for billing and revenue statistics for the 140,000 customers and for addressing customers' bills. This group also does the addressing work for pay roll, stores, general ledgers and operating ledgers. Considerable saving in cost has been realized.

A design of a functionalized cashier booth, desk and working area for a district office was described with the aid of drawings and photos by C. A. Caulfield, Washington Water Power Co. This was designed primarily for the smaller offices of the company where cashiers had to double as stenographers and perform other jobs. It is part of a modernizing program, having the principal function of improving working conditions and efficiency of district offices.

F. C. Bash, California Oregon Power Co., introduced a discussion of construction accounting by explaining the methods and procedures used in his company, including budgeting, budget control and accounting methods. Discussion centered around the practices of the several companies in capitalizing engineering, supervision and such overheads as vacation, sick leave pay, compensation, liability insurance, social security taxes and stores overheads. There was a rather wide variance in the practices of the several companies.

The subject of stores accounting was led by C. B. Schoeggl, Puget Sound Power & Light Co., who told of the methods employed in stores accounting in his company with IBM equipment. In spite of errors both human and machine that creep into stores accounting, better and quicker results have been obtained in handling the $1,500,000 of general inventory on a construction program averaging above $6,000,000 per year.

Considerable interest was displayed in a report by I. E. Joslyn, Idaho Power Co., on that company's experience in billing in units of ten kilowatt-hours. The company has ceased reading the right hand dial of the meter and prints a cipher for it in the meter books, and bills in units of ten to the nearest even nickel. This has resulted in simplified billing charts and meter reading sheets, has speeded reading and billing, and speeded the work of the cashiers. Almost no complaints have been received from customers. Utah Power & Light Co. is the only other company now billing in this manner, having started it within the past few months. Meter reading error has dropped from .6 to .4%. The company has had one complaint from 85,000 accounts in one district.

Pay roll procedures of the companies were explored with T. C. Woodside, Utah Power & Light Co., as discussion leader. Discussion was chiefly around time keeping in the field and pay periods. Some companies find biweekly pay the most acceptable to employees. Mountain States Power Co. and Idaho Power Co. pay monthly with an advance in the middle of the month of approximately one-half the employee's earnings in round dollars.

Under discussion of credits and collections, with Ralph W. Lawlor, Pacific Power & Light Co., leading the discussion, the question of the adequacy of the reserve for uncollectible accounts was posed and delegates were advised to check this reserve against the following formula. The reserve should be the sum of 2% of accounts not delinquent, 5% of one month old, 15% of two months old,

35% of three months, 70% of those disconnected one month and 90% of those disconnected over one month. Bad debt loss was found to run somewhere between 1/15 and 1/20 of one per cent of billings.

Policy with respect to pay stations varied but it was generally agreed that 5c per transaction was about right, and that this method of paying for such collections was better than paying on a percentage basis. Most companies are stiffening up their collection procedures.

Clause Groth, Pacific Power & Light Co., stated it was the responsibility of accounting officers to give management tools with which management can work. The accountant should know his management well enough to suggest things that management ought to know in order to make decisions, and should interpret and analyze the figures presented. In the course of this discussion, it was found that the trend in presenting periodic reports was to speed up these reports, at least preliminary figures on earnings, gross and net, against budget, and compared with the previous year. Several of the companies are now producing preliminary figures on the sixth day after closing, with a complete report out on about the twelfth day.

The group nominated V. T. Montgomery, Idaho Power Co., to be section chairman for next year, with Frank C. Bash, California Oregon Power Co., as vice-chairman.

● Officers for the Los Angeles Section, AIEE, for 1950-51 are: J. H. Vivian, Southern California Edison Co., chairman; E. K. Sadler, Kelman Electric & Mfg. Co., vice-chairman; F. W. Rockwell, Metropolitan Water District of Southern California, secretary-treasurer; C. R. Moore, CAA, vice-chairman, aircraft division; C. A. Wells, Southern California Telephone Co., vice-chairman, electronics division; C. G. Mansfield, Department of Water & Power, vice-chairman, power division. On the executive committee are: E. Dale Barcus, Pacific Telephone & Telegraph Co.; Dr. G. T. Harness, University of Southern California; H. A. Lott, Southern California Edison Co.; H. S. Warren, Rome Cable Corp.

● Boulder City Subsection, AIEE, has the following officers for the 1950-51 term: William M. Doak, Colorado River Commission of Nevada, chairman; F. A. Latham, Department of Water & Power, vice-chairman; L. J. Hudlow, USBR, secretary-treasurer; Thomas Sears, USBR, member at large; William S. Hunt, Department of Water & Power, membership chairman.

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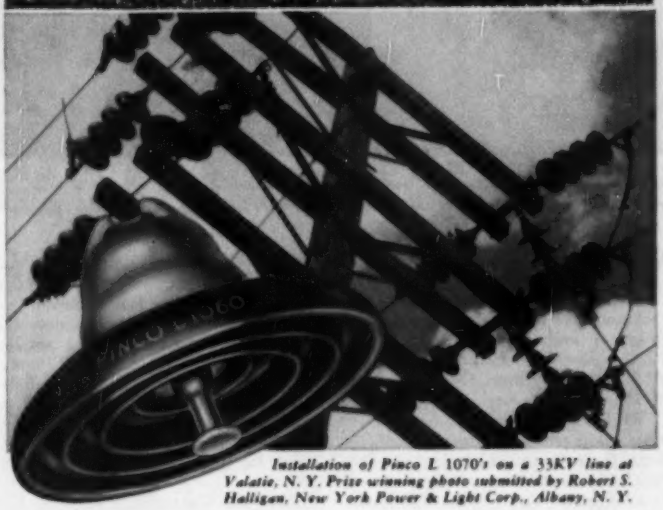

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• 1920 Thirty Years Service to the Electrical Industry 1950 •

Some of the many manufacturers' and distributors' exhibits at the meetings staged by the Electrical Contractors Society of Washington in recent months. They were held in a series of Washington towns to aid contractors to sell better installations, not cut them

Contractors

Pacific Electrical Contractors Assn., Portland, has enlarged its publication, *Electron*, and changed its name to *Pacific Electrical Contractor*. Roscoe E. Watts is its editor. The association, of which Glen Emory is president and I. W. Rodgers, secretary, heard Paul MacCaskill tell of the many angles of their business in which insurance is involved; and Long Stoler, North Coast Electric Co., discuss distributor sales policies, and held a meeting to promote cooperation with architects. One of the most valuable meetings recently was one with meter department officials of the two power companies over approval of meter bases. Since the utilities discontinued furnishing meter bases confusion had resulted over types acceptable to them. Actual models of various types were brought to the meeting and discussed. Distributors too were given a chance to express their views. The meeting accomplished much toward standardization.

Electrical Contractors Society of Washington is planning to hold its annual convention in Seattle, Nov. 30, Dec. 1-2, according to T. Ralph Neilson, manager. It has closed an active year of activity with a summer recess from its local meetings and exhibits. Not long ago it held a third annual wholesaler-contractor dinner and at it John C. Hewitt, state chief electrical inspector, urged closer collaboration in the industry to get better electrical laws. He asked that the state law be strengthened by qualifying licensing and adding a system of permit fees. Glen Charles, Seattle's chief inspector, asked contractors to pay more attention to what was going on in the industry, referring specifically to range and water heater installations. Julius Hooper, founder of the society, reviewed the group's accomplishments since its incention. Manager Neilson, just returned from the Mid-West Electrical Council Exposition at St. Paul, attributed the success of that huge electrical show to full industry cooperation. He likewise pointed the need for organization of the smaller contractors and the help that manufacturers' representatives and wholesalers could give to these men through organization. Arthur Siegal, president, expressed appreciation to the wholesalers for their participation.

Electrical Contractors Assn. of Los Angeles is far from extinct but is carrying on monthly meetings of educational value, its secretary, Robert Tottleben, Val Electric Co., Los Angeles, assures. Its officers are Robert Manning, Electric Power Engineering Co., president; C. D. Fink, Aero Electric Co., Sun Valley, vice-president; Robert Tottleben, Val Electric Co., Los Angeles, secretary; Fred C. Geiss, Sterling Electric, San Fernando, treasurer and Carl Lertzman, 5455 Hollywood Blvd., business representative, where the office is maintained. Committees on membership, codes, auditing, labor, entertainment and welfare are operating and legal counsel is offered members at a nominal charge. The association has two grades of membership—active, for licensed contractors or their representatives; and honorary. An executive board of the officers and seven members meets monthly. Dues are $50 a year or $5 monthly. The association represents its members at code committees, city and county, chamber of commerce, major disaster committees, state safety orders, state license board, IAEI, utility relations, etc.

NECA

Reservations for hotel accommodations for the National Electrical Contractors Assn. annual convention at the Biltmore, Los Angeles, are now being cleared through the Los Angeles Chapter, 124 West 24th St., Los Angeles 7. Dates are Oct. 17-20. Theme is, "Progress Through Efficient Management and Training." Featured will be the NECA technical and management personnel training program started at Houston last year and on which E. R. Cornish, Western regional director, has been so active. The convention committee is headed by A. L. Stone, veteran of the 1938 NECA convention in Los Angeles, aided by Richard E. Arbogast, R. F. Doll, R. Max Fry, Herbert L. Evans and Sidney F. Hill, president of the chapter. Details of the program will be given next issue.

Line construction problems in the five Rocky Mountain states were analyzed at a meeting in late June at Pocatello, at which representatives of the National Electrical Contractors and the International Brotherhood of Electrical Workers participated. While no uniform line agreement has come out of the meeting as yet a memorandum signed by both union and contractor representatives clarifies some controversial points. It permits more work to be done by groundmen supervised by journeymen linemen—framing poles, mounting insulators and hardware, setting anchors, digging holes and hauling poles—it set up rules on travel time and transportation and allows setting up of field headquarters and camps, moving of entire crews and clearances with other crafts. It recognizes the REA scales where they are in effect and thus permits electrical contractors to be somewhat more competitive with non-union or general contractors on line work. It was not felt as yet that a line constructors chapter would be needed nor an area agreement. A conference committee was set up to take care of any controversial issues.

Attending the meeting were Fred Chivers, Salt Lake City; C. H. Simpson, Cheyenne; J. E. Collier, Denver; J. P. Jacobson, Boise; Chester Hartz, Butte; Edward O'Neil, Havre; Harry Rheutara, Boise; C. L. Lewis, Poca-

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tello, and employers representatives, E. R. Cornish, NECA Western director; G. A. Howarth, Utah Chapter; Larry Rodgers, Northwest Line Constructors manager, Portland. For the union were C. W. Wright, vice-president IBEW; Carl Tobiassen, Denver Local 111; J. J. Nichols, Salt Lake City Local 57; R. R. Priest, Boise Local 291; S. E. Thompson, international representative, and F. J. Belisle, Pocatello Local 449.

Meanwhile the California-Nevada Line Constructors Chapter representatives and IBEW officers got nowhere towards an area agreement on line work. A meeting was held in July in San Francisco.

A Northwest Conference of NECA Chapters now is organized. A meeting in Portland, July 7, agreed on a constitution and bylaws similar to those of the California Conference, omitting dues, giving each chapter three registered delegates, the chapter manager being one and also given a vote. Four chapters are included—Puget Sound, Spokane, Oregon-Columbia (formerly Portland) and the Northwest Line Constructors. Meetings are to be held every 90 days or on special call. E. B. deFeyter, Power City Electric Co., Spokane, was named chairman; George B. Schetky, Western Electric Construction Co., Portland, vice-chairman and Robert L. Wilkinson, Spokane manager, was chosen secretary.

Oregon-Columbia Chapter, NECA, is the new name adopted by the former Portland Chapter. It more nearly describes the area of the chapter, which has members across the Columbia River at Longview and Kelso, Wash., as well as at Portland, Bend, and McMinnville. Laurence C. Rodgers, its secretary-manager, also announced a move to 1432 S.W. Sixth Ave. from the Oregonian building. Office of the Northwest Line Constructors Chapter, of which Rodgers is also manager, is now at the same location.

Robert Hughes of Spokane was recently appointed District 6 representative on the NECA National Line Constructors Section succeeding Ralph Lane of Seattle, who asked to be relieved as his firm was not active in line work.

Norman Ferguson, California Electric Works, San Diego, was appointed District 6 NECA Business Promotion Committee representative by the California Conference of NECA Chapters.

Utah Chapter of NECA re-elected W. P. Robbins, Salt Lake City, as its president for another year at its recent annual election. C. L. Murphy of Ogden was named vice-president and E. E. Oberg, treasurer. The directors elected include Jack Laub, Logan; L. A. Herdti; Glen Staker; Floyd N. Shipp, Midvale, and R. W. Bauchman, chairman of the Idaho Falls branch and A. R. Wooley of the Pocatello branch. G. A. Howarth is manager.

WIRING DEVICES, fixtures, ventilating, signal and communications systems were shown to more than 100 electrical contractors of San Diego County when the Bureau of Radio & Electrical Appliances held its second annual contractor display meeting. After an enjoyable dinner, educational and sales talks were given by H. G. Dillin, San Diego Gas & Electric Co.; Jerry Zegeritez, Square D Co.; Bill McKinley and E. W. Meise of the utility and Lloyd Hallamore, Touchplate Co. Bert Reynolds, contractor, was chairman of the division

Harry Simmons, nationally known management consultant from New York, talked to Los Angeles Chapter members of National Electrical Contractors Assn. on July 12 at the Edison Auditorium. The meeting was attended by 116 members and some 125 contractor guests. Simmons spoke before the NECA convention in Houston last fall. His new book *Successful Selling for the New Day* is now being published.

IES

Watch next month's ELECTRICAL WEST for a full report on Illuminating Engineering Society's National Technical Conference, being held this year at the Hotel Huntington, Pasadena, Aug. 21-24. Program of the technical conference was published in last month's ELECTRICAL WEST. Entertainment will be elaborate, with a Mexican-Spanish Fiesta Night, an afternoon visit to one of Hollywood's major movie studios, president's reception, banquet and ball. The ladies' reception committee has planned special tours, teas and entertainment.

Lighting for amateur photographers was discussed by R. E. Birr, illuminating engineer from General Electric's Lamp Department. Nela Park, before the Utah Chapter, IES at the last meeting of the fiscal year. . . . Previous meetings featured such top-flight speakers as R. J. Swackhamer of Schenectady, IES national committee chairman on lighting for sports and recreation and also IES technical committee; H. T. Bean, district airport engineer; Jim Ketch, engineering division of General Electric Lamp Department, Nela Park.

A. H. Taylor of Nela Park, widely experienced in the development of light meters and instruments, spoke recently to Northern California Section, IES, members on the subject "Automatic Street Lighting Meter."

Southern California Section, IES, members were taken on an armchair tour of southern California's outstanding lighting installations of 1950 recently with photo slides and application data. Members Ralph Crump and Ed Balogh presented school lighting; Walter Alden, industrial lighting; Louis Black, commercial lighting . . . A previous meeting was devoted to the topic of "Microtime Photographic Techniques," discussed by Dr. A. M. Zarem, director of the Los Angeles Division, Stanford Research Institute.

Inland Empire Chapter, IES, at a recent luncheon meeting in Spokane, heard Dave Parker, illuminating engineer, Columbia Electric & Mfg. Co., discuss candlepower curves.

Electric Clubs

Newly elected officers of the Los Angeles Electric Club, installed during the group's last meeting of the season, are Arthur H. Howard, Tri-State Supply Co., president; John L. Tindale, Anaconda Wire & Cable Co., first vice-

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president; Ivan L. Bateman, Los Angeles Department of Water & Power, second vice-president; Douglas G. Kendall, Square D Co., third vice-president; Carlisle Bailey, Newbery Electric Corp., secretary-treasurer; Louis R. Grime, Graybar Electric Co., sergeant-at-arms. New executive committee members are Frank A. Ballman, Thermador Electric Mfg. Co.; E. M. Ellis, General Electric Co.; Stanley M. Johns, Westinghouse Electric Corp.; E. E. Karsten, Gough Industries Inc., and out-going president, Joseph A. Long, Southern California Edison Co.

Electric Club of San Francisco heard from Dunlap D. Smalley, vice-president in charge of operations, Pacific Gas and Electric Co., at its last meeting until fall. . . . Previously had as guest speaker Dr. Ralph Brown, director of research, Bell Telephone Laboratories, N. Y., with a discussion on research problems in network television. . . . Also saw a movie, *Of This We Are Proud*, produced for Nash-Kelvinator Corp. and presented by J. A. Warren, zone manager.

Electric Club of Oregon had as recent guest speaker Dr. Paul J. Raver, Bonneville Power Administration, with a discussion on the congressional reaction to his presentation in Washington of the Federal Power Blue Print 1950-56; also Henry Chateau, Portland representative of Underwriters' Laboratories.

In San Diego the Electric Club recently had as guest speaker Frank Van Gilluwe, who discussed "The Evaluation of Light." Chairman of the day was Oscar "Tommy" Thompson, General Electric Supply Corp.

B.C.

Members of the Victoria Electrical Assn. were guests of the B. C. Electric Co. recently on a visit to the Jordan River hydroelectric plant of the company. The tour was arranged by the Victoria branch of the Electrical Service League and the sales division of the power company. J. M. Elliott, plant superintendent, was host.

EMEA

Northern California EMEA members learned about the application and control of electric heat from Thomas M. Hart and James C. Harris, both of Montgomery Bros., at the group's June 22 meeting in San Francisco. The speakers covered the application of electric power to numerous commercial and industrial problems.

EMEA of Southern California saw the film *More Power To You* presented by the Los Angeles Department of Water & Power, at its July 19 meeting. The movie showed the relation of power demands to the growth of Los Angeles in industrial and domestic service. Speaker of the day was A. L. Williams, engineer of distribution and transmission design, who told of power system planning for the future growth of Los Angeles, predicting future requirements of power based on population and land rise studies. He illustrated his talk with slides. . . . EMEA members have their own library now, equipped with technical books and a selection of monthly trade magazines.

Previous EMEA meetings in southern California featured Errol S. Carpenter, field engineer of the Edison Storage Battery Division, Thomas A. Edison Inc., who presented two films, *Storage Battery Power* and *Modern Battery Shop Practice*; business meeting with the chief subject "Industrial Plant Distribution," and Emerson S. Reichard, chief electrician, General Petroleum Corp., as moderator. Featured Joe Paul, chief electrical engineer, Ralph M. Parsons Co., on plant distribution layout; Carl Degering, sales engineer, General Electric Co., on available equipment for plant distribution system construction; L. S. Peterman, director of industrial power development, Southern California Edison Co., on the power company's part in plant distribution systems; E. V. Muller, assistant electrical safety engineer, State Division of Industrial Safety, on code highlights.

IEEDA

Inland Empire Electrical Dealers heard international views of the appliance industry from Oswald F. Mingay, publisher of *Radio Electrical Weekly*, Sydney, Australia, at a recent general meeting of the Spokane, Coeur d'Alene and Big Bend Chapters in Spokane. Mingay, a pioneer of Australia's radio and appliance industry, toured Europe and the United States observing the electrical industry, talking with radio and appliance manufacturers and dealers.

Palouse Chapter, IEEDA, met at Colfax, Wash., on July 20 to hear a talk on a survey of the appliance market by Professor Fiske of Washington State College.

NCEB

Plans are shaping up for Electrical Wonderland, a Mid-Century Exposition of Electrical Progress, says the sponsor Northern California Electrical Bureau. The big show, expected to draw some 100,000 people, is scheduled at the San Francisco Civic Auditorium, Sept. 23 to Oct. 1. Manufacturers, wholesalers, retailers, contractors and utilities will all present the newest in products and services. Top quality entertainment is being planned with stars, music, education and scientific shows, radio and TV programs.

IEA

Annual outing of the Intermountain Electrical Assn. is scheduled for Aug. 18 at Lagoon Resort. . . . IEA membership has been asked to submit articles and suggestions for the *IEA Dispatch*, association publication. . . . Recent meeting presented C. Richard Evans, general manager of KSL Radio Station, whose subject was "You Can't Stop Television Now."

RMEL

Partial list of important speakers on the program of Rocky Mountain Electrical League's annual fall convention includes L. V. Sutton, president of Edison Electric Institute; R. S. Peare, vice-president of the advertising and publicity department of General Electric Co., Schenectady; J. W. Parker, president of Detroit Edison Co.; H. B. Sargent, president of Central Arizona Light & Power Co.; Al Cornish, National Electrical Contractors Assn.; C. H. Goddard, president of Illuminating Engineering Society; Alston Rogers, Nela Park. The convention is scheduled at the Broadmoor Hotel, Colorado Springs, Oct. 8-11.

Electric industry picnic, sponsored jointly by the Denver League of the Rocky Mountain Electrical League and the Rocky Mountain Chapter of National Electrical Contractors Assn., was slated for Aug. 4 at Elitch's Gardens.

IRE

Sixth annual Pacific Electronic Exhibit will open in the Long Beach municipal auditorium Sept. 13 for three days. This year, in addition to the displays, the event will also be a conference for electronic business leaders and engineers. The West Coast Institute of Radio Engineers Convention will again be held in the same building during the three-day exhibit. There will be field trips and social events.

Pot and Kettle Club

Seattle Pot and Kettle Club has elected a new panel of officers headed by Stan Clark, Vinton Co. Jesse Fetterman, Fetterman & Lockwood Co., is first vice-president; Stan Brand, L. L. Raymer Co., second vice-president; Stan Bunker, Harper-Meggee, recording secretary; Bob Walters, Frederick & Nelson housewares buyer, treasurer.

Leagues

Electric League of Los Angeles Inc. has scheduled its annual industry-wide summer outing at the Elysian Park Lodge, Aug. 6.

NEW M.P.L. STRAIN CLAMPS

The new Minimum Power Loss Series of Strain Clamps, now being offered by BTC, reduce hysteresis and eddy current effects to a minimum . . . save power . . . insure against heating, annealing and weakening of conductor within the clamp . . . and improve corrosion resistance.

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THE MONTH IN BRIEF

Purchase Up to Voters

Seattle voters will decide at the November election if the city will pay $25,850,000 for Puget Sound Power & Light facilities in the Seattle competitive area. Included is the 23,000-kw. Georgetown steam plant. Final price was approved by company directors and the Seattle City Council last month. The deal also involves a contract between the two utilities for 83,500 kw. of firm energy to be delivered by Puget for the period from date of acquisition to March 14, 1952, at $17.50 per kw-yr. The property to be sold represents about 40% of Puget's total revenue and 25% of its electric valuation. "Tough sledding and a hard bargain" is the way Puget's President Frank McLaughlin characterized the deal.

Future Course Uncertain

Puget's future course after disposing of its Seattle property depends upon many factors. Several PUD condemnation suits are pending. So too is a condemnation suit by Tacoma for a portion of Puget's generating and transmission facilities. In King and Pierce counties outside Seattle and Tacoma some fourteen small cities have been encouraged to undertake municipal ownership by different groups of investment banking firms. Also petitions are being circulated in King County for the formation of a PUD. In other service areas cities and PUDs are bickering. Conceivably, in the opinion of qualified observers, Puget might now be able to refinance and continue to function as an integrated utility, especially if public ownership agitation should subside.

Northwest May Get Natural Gas

Industrial prospects in the Pacific Northwest may well be given a powerful stimulus if recently proposed plans for the introduction of natural gas into Idaho, Oregon, Washington and British Columbia should materialize. The same Texas interests headed by Ray Fish, that are transporting natural gas from the Gulf Coast to New York, propose to build a 350,000,000-cu.-ft. capacity line to Denver, Salt Lake, Boise, Spokane, Portland, Seattle, Tacoma and Vancouver and Victoria, B. C. Atomic Energy Commission plants at Hanford, Wash., and Arco, Idaho, would also be served by this 2,400-mile line. Gas supplies from the Alberta fields in Canada also would ultimately be tapped by a feeder line. The gas would be available for fuel in steam plants at prices competitive with oil.

Use Tax Scored

Southern California Edison Co. and other public utilities serving Santa Barbara have entered objections to that city's new use tax, labeling it "absolutely impractical." The ordinance, aimed primarily at liquor purchases, also levies a tax on merchandise bought elsewhere and used within the city. The utilities are subject to taxation on all equipment used in Santa Barbara. Their request for exemption points out that the law sets up a tremendous bookkeeping problem in view of the constant transfer of equipment in and out of the district.

Fourteenth Unit on Line at Coulee

Grand Coulee's fourteenth 108,000-kw. generator has gone into production, feeding its power into the Pacific Northwest Power Pool. The unit R-5, the fifth generator in the east power house, is the second generator to go into service this year, with a third scheduled for Oct. 15. The final three generators are to be in service before the end of next year. Peak capacity of the 14 generators now in operation is 1,750,000 kw.

PP&L Stock Up for Sale

Plans for the sale of Pacific Power & Light Co. common stock to the public are being perfected by the investment bankers who purchased the holdings from American Power & Light Co. Last month Pacific President Paul B. McKee started a 60-day tour of financial centers singing the praises of Pacific and the territory it serves. In his sales kit was a new talking color motion picture produced under the supervision of Pacific Vice-President John Dierdorff.

Kaiser Plans Aluminum Plant Expansion

Kaiser Aluminum and Chemical Corp. has purchased one of three pot lines located in the war-surplus aluminum plant at Riverbank, Calif., and will move it to the firm's Mead reduction plant near Spokane, Wash. This will make the seventh pot line at Mead and will bring annual capacity to about 250,000,000 lb. Arrangements have been made with Bonneville for power requirements on an interruptible basis, although interruptions seem unlikely in view of instructions from Interior Secretary Chapman to Administrator Raver to cooperate in making power available for expansion of aluminum production in the Northwest. The Riverbank plant was built during World War II and operated by Alco. It had been for sale since it was shut down following the war.

Los Angeles Manufacturers Struck

AFL's International Brotherhood of Electrical Workers called a strike last month against Los Angeles electrical manufacturers. An estimated 1,000 electrical workers left their jobs, mostly in lighting fixture manufacture, on July 13 when negotiations over contract renewals broke down. They went back to work July 31 after an agreement was reached on an 8½c hourly increase in all categories except the starting rate, which was upped 5c. The union, Local 11, had been asking a 10c hourly wage increase. The new wage range is from $1.18½ to $2.16½ per hour. Among the struck manufacturers were: C. W. Cole & Co.; Commercial Reflector & Mfg. Co.; Cross Lighting Co.; Globe Lighting Products Inc.; Lumidor Mfg. Co.; Ruby Lighting Corp.; Sunbeam Lighting Co.; Otto K. Olesen Company.

THE WASHBURN TUNNEL, PASADENA, TEXAS

Strategically located, this new 3791-foot vehicular tunnel borrows beneath the Houston ship channel to link the cities of Pasadena and Galena Park in Harris County, Texas.

Completely surfaced with glossy ceramic tile, the curved walls and two-way thoroughfare are evenly illuminated by over 500 2-lamp SUNBEAM slimline fixtures. Specially designed by SUNBEAM to meet tunnel specifications, these units are mounted in continuous rows throughout the full length of the tunnel.

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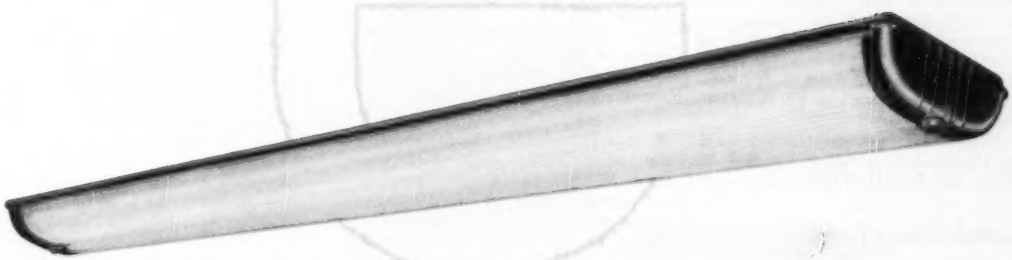

Constructed entirely of aluminum extrusions and castings, this new unit (2200 series) features a one-piece, clear-ribbed polystyrene plastic panel which is supported along its entire length in interlocking aluminum extrusions which are gasketed to inhibit water seepage. Designed to take from one to four 72" slimline lamps in any milliamp rating including 430MA, this new unit has been constructed especially for installations in any area where atmospheric conditions warrant special considerations. For complete technical and mechanical information write:

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THIS MONTH'S NEWS

El Paso Electric Continues Expansion

Having completed a $7,500,000 expansion program in the past three years, El Paso Electric Co. is putting another $7,000,000 into improvements. Major expenditure will be for a $4,500,000 turbogenerator, capable of producing 40,000 hp. at the company's Rio Grande plant, 5½ miles northwest of El Paso.

The new generator is being placed adjacent to a 20,000-kw. unit installed a year ago at a cost of $3,250,000.

Completion of the 30,000-kw. generator in January will mark an increase in firm power capacity from 64,500 kw. at the close of the war to 114,500 kw., an increase of 77%. Since 1938 the company's power capacity has shown an increase of 141%.

In addition to the new turbogenerator, other improvements totaling $2,500,000 are in progress. They include transmission lines, substations, additions to the underground network, automatic control devices, a two-way radio system for service men, and $387,000 for a new office building.

Power from the generator will be carried to a new 37,500-kva. transformer in the Rio Grande plant substation and will be stepped up from 13,800 volts to 66,000 volts for transfer over five power lines to the company's major substations up and down the valley.

Engineering and construction work on the project is being handled by Stone and Webster Engineering Corp.

Central Arizona Company Buys Generating Plants

Central Arizona Light and Power Co. has completed purchase of electric power generating plants of Southwest Lumber Mills Inc. at Flagstaff and McNary. The price was about $1,250,000, with an additional $200,000 scheduled for improvements.

The generating plants use sawmill waste for fuel. They were built by the lumber company to provide power and steam for mill operations. The McNary generator has a capacity of 7,400 kw. and the Flagstaff plant 3,000 kw.

The sale contract stipulated the power company is to purchase waste material from the sawmills and Southwest agreed to purchase power and steam.

Surplus power will be distributed over Northern Arizona Light and Power lines in the Flagstaff area. Northern is a subsidiary of Central Arizona Light and Power. In the McNary area, surplus power will be supplied to Navapache Electric Cooperative Inc.

P G and E Lets Contract For Bear River Project

Contract for construction of a rock fill dam and 1,094 ft. of a 14,000-ft. water tunnel for Pacific Gas and Electric Co.'s Bear River development on the Mokelumne River has been awarded to Utah Construction Co., which submitted the lowest bid among seven competitors.

The work is part of an $11,000,000 hydraulic system designed to add 44,000 hp. to the company's Mokelumne River system. The new generating unit will be installed in the existing Salt Springs power house at the head of the river. When completed, the project will have two rock fill dams, forming a reservoir holding 48,500 acre ft.

Scheduled for completion in the spring of 1953, the project is expected to bring the capacity of the Mokelumne plants to 293,000 hp.

● Low Bid of $256,951 for construction of a 230-kv. transmission line from Maupin to Detroit, Ore., was submitted to the Bonneville Power Administration by Parker-Schram, Portland. The line will carry Bonneville power to the site of Detroit Dam, unit of the Willamette Basin Project, under construction by the Corps of Engineers.

● A second election will be required before Tillamook County (Ore.) PUD can sell a $1,500,000 bond issue. At an election May 19 the district voted 2,168 to 1,525 to authorize issuance of the revenue bonds, but attorneys for a brokerage house that planned to purchase the bonds held that insufficient information was contained in the ballot. The funds were to be used to extend the district's electrical services throughout Tillamook County.

Preliminary Study Underway at Dam Site

Preliminary investigation work by the Corps of Engineers is under way at the site of the proposed Albeni Falls Dam on the Pend Oreille River, two miles east of the Idaho-Washington state line.

Two drilling crews are doing subsurface exploration work and a survey crew also is in the field.

The proposed dam will serve the multiple purposes of power, flood control, navigation, recreation, and fish and wildlife conservation. The hydroelectric installation will consist of three Kaplan turbines driving generators with a total rating of 42,600 kw., first two of which are proposed to be placed on the line in 1954 and the third early in 1955.

The dam was authorized by Congress in the 1950 Flood Control Act and $40,000 was made available to begin the preliminary investigation. No construction funds have been appropriated but work is tentatively planned to begin in the 1951 fiscal year.

Cost of the project is estimated at $31,070,000. The dam, founded on a granite reef which crosses the river, will be 1,100 ft. long. The spillway section will occupy the channel on one side of an island and a power house the other channel. The structure will be a concrete gravity type with a submerged spillway 90 ft. high and 700 ft. long. The power house structure will be 380 ft. long and serve as a non-overflow abutment. The plant will have a normal gross head of 22 ft.

Seattle Approves Plans For Six Substations

Plans for the construction of six City Light substations at Seattle, Wash., have been approved by the Municipal Board of Public Works. The program, as proposed by E. R. Hoffman, City Light superintendent, calls for two $76,000 alternating-current substations, three $121,000 direct-current substations and one $275,000 combined a-c and d-c substation. In addition, a portable rectifier set will be provided for stand-by service at a cost of $18,000.

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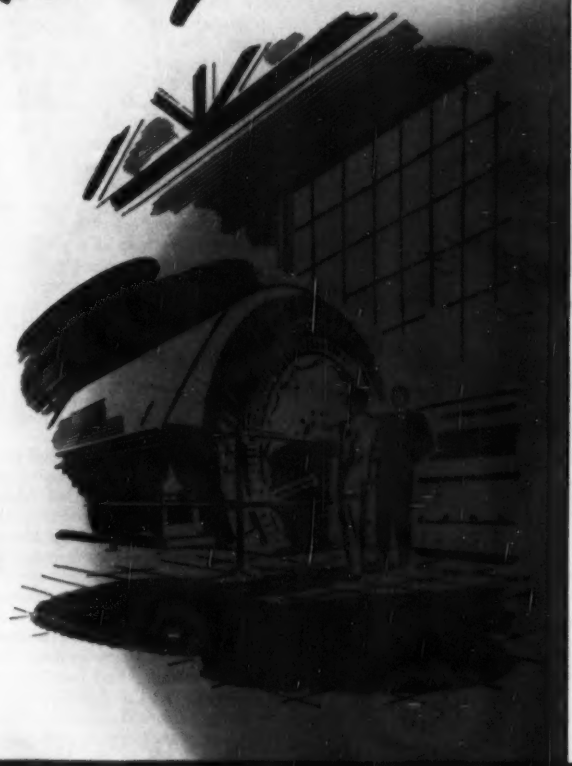

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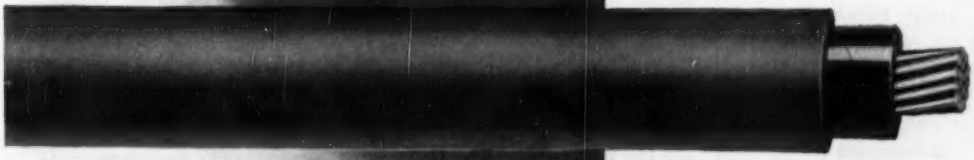

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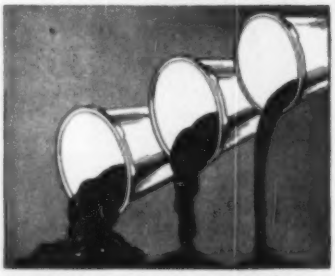

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STUDY LICENSING OF RAINMAKING

With a view to encouraging responsible and discouraging irresponsible rainmakers, the California Water Resources Board has ordered its legal staff to make a study of possible licensing for the new profession.

Board Member Phil D. Swing, San Diego, had proposed that rainmakers be licensed and supervised by the state, noting that their activities had gone beyond the stage of experimentation and have in some cases become regular practices. The legal study on his proposal will be ready in September.

Meanwhile, in the Cuyama, Calif., valley, Hubbard Russell, rancher, has such faith in the new process that he volunteered to pay for insurance to cover any damages resulting from rainmaking operations under way in the area. The parched valley had hired C. S. Barnes, an Arizona rainmaker, for chemical cloud-seeding.

Russell's offer came at a meeting of local water conservationists, and would cover every person in the valley for liability due to water damage—provided such insurance were available.

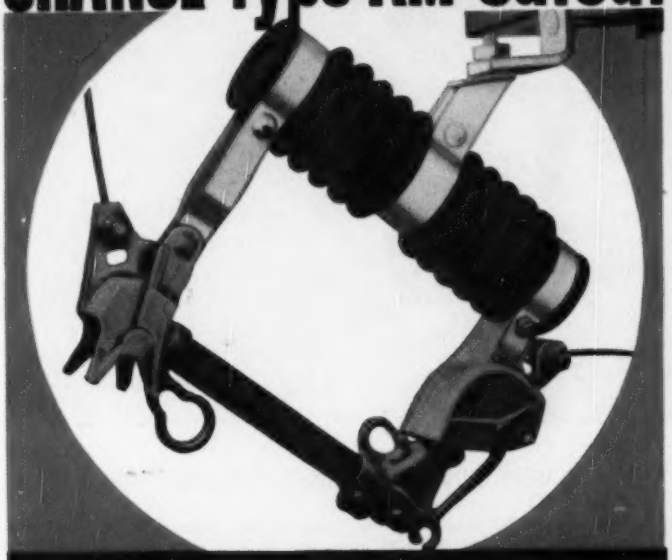
State-Fostered Rainmaking Study Underway

One of the first state-fostered rainmaking study projects recently got under way at the School of Mines, Socorro, New Mex. It was made possible by $17,500 from the New Mexico Economic Development Commission and from the state.

The project had been inaugurated at a meeting of 200 of the state's leading ranchers, farmers and business men, and a number of scientists. Concern of the meeting had been to halt what the scientists call "wildcat cloud-busting." Dr. Irving Langmuir, Nobel prize winner, stated that he was almost certain that floods in the Mississippi and Winnipeg had been caused by indiscriminate cloud seeding in the Southwest.

After the meeting, the New Mexico Economic Development Commission gave the School of Mines $7,500 out of its $20,000 budget for the project, and obtained $10,000 more for it from emergency funds. The project, headed by Dr. E. J. Workman, president of the School of Mines, has the consultant services of Dr. Langmuir, who had been in charge of Operation Cirrus, a General Electric Co. rainmaking project at Schenectady, N.Y. Langmuir and Workman had cooperated in a successful Operation Cirrus experiment at Albuquerque in July 1949.

CHANCE type KM Cutout



"Kick-Out"* Operation—Cuts Costs

The Chance KM Cutout KICKS OUT at the bottom after fault—a mechanical development that not only gives positive indication, but adds these cost cutting advantages:

1. **Longer Life Fuse Tube**—No water in tube after fault—No warping—Fast mechanical ejector—No link hang-up inside tube.
2. **No Link Breakage**—No stress on link in closing.
3. **Longer Life Contacts**—No pitting—Arc extinguished before contact breaks.

a glance tells the story

Only Chance Type KM Cutouts have this two way operation and all these plus features:

1. Non-corrosive concealed ejector spring.
2. Heavy Castings.
3. Sleet shields over all moving parts.
4. Accessible cast-in terminal lugs.
5. Pivotal mounting bracket. (E.E.I.-NEMA)
6. Arc gas deflector.
7. Meets all NEMA requirements.

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A. B. CHANCE CO.

CENTRALIA, MISSOURI • SAN FRANCISCO, CALIFORNIA

The studies will attempt to determine relative effectiveness and stability of several cloud-seeding materials; find effective methods of dispersing these materials; devise methods of tracing seeding materials in order to establish procedure for seeding control; make a statistical study of rainfall data correlated with atmospheric circulating patterns; make field tests of existing procedures and possible new procedures in critical areas of New Mexico.

B. C. Power Commission Will Pay Companies

Disposal has been made of the legal case between the B. C. Power Commission and companies which had been expropriated five years ago. The long drawn out decision was announced recently by Justice J. O. Wilson at Victoria.

The power commission will pay more than $1,800,000 to three companies taken over in 1945. Delay in final decision was caused by appeals of companies affected by the order and the payments.

Justice Wilson was appointed by the legislature last year to make a final decision. His decision requires the commission to pay $1,211,792 to the West Canadian Hydro Electric Co., $67,000 to the Columbia Power Co., and $601,000 to the Nanaimo-Duncan Power Co.

Totals already paid by the commission to the companies amount to $3,289,700 to the West Canadian Hydro Electric, $1,706,000 to Nanaimo-Duncan, and $227,000 to the Columbia Power Co.

The commission said it has now paid $8,000,000 into expropriated companies and has $40,000,000 invested in construction and reconstruction.

● T. B. BLACK, general manager of Northern B. C. Power Co., announces his company has purchased the steam generating plant owned by the Canadian National Railways at Prince Rupert, B. C., drydock. The plant will be used as the site of three diesel generating units to be installed to augment present power resources in the northern British Columbia port.

● An $88,000 DIESEL-ELECTRIC generating plant will be built this summer at Lillooet, B.C., for the B. C. Power Commission. Proposed development of a hydroelectric project to serve the area was postponed when it was found this undertaking at Cayoosh Creek would run to a prohibitive figure in relation to the consumer demand.

ALASKA'S NEED FOR ENERGY DETERMINED IN SURVEY

The Territory of Alaska will require 864,000,000 kwh. of electric energy in 1960, as compared to the 126,000,000 it used in 1947, the Federal Power Commission estimates in an "Alaska Power Market Survey" made at the request of the Corps of Engineers.

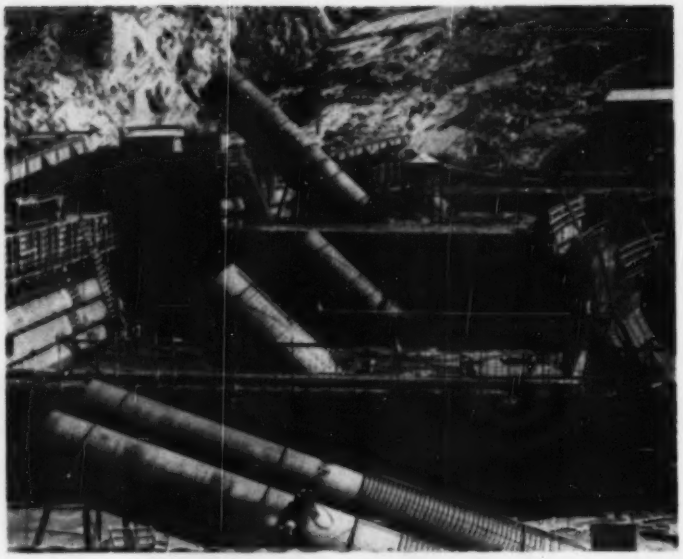
The estimate assumes development of a wood pulp industry in southeast Alaska, production from Arctic oil fields and continuation of present military activity.

Generating capacity of Alaska's non-military electric power plants would have to be increased from the 71,000 kw. of 1947 to 173,000 kw. to meet the estimated demand. Of the 71,000 kw. about 28,000 was hydro-electric, 30,000 steam-electric and 13,000 diesel. Although 66% of the 1947 generating capacity was owned and operated by industries, principally for their own use, only 34% of the amount of power required was industrial. Thirteen utility systems produced 83,000,000 kwh. of which 78% was in the four principal load centers —Anchorage, 32%; Ketchikan, 21%; Juneau, 14%, and Fairbanks, 11%. Nine other utilities used 22% of the power produced.

In 1960, the commission estimates, Anchorage will require 222,000,000 kwh.; Fairbanks, 147,000,000; Ketchikan, 133,000,000; Juneau, 128,500,000; Wrangell, 116,000,000; Sitka, 73,000,000; Nome; 18,400,000; Kodiak, 7,600,000; Petersburg, 7,000,000; Seward, 3,400,000; Cordova, 3,100,000; Skagway, 2,700,000 and Valdez, 2,400,000.

Ketchikan has the lowest residential electric rates in Alaska while Juneau's rates are the lowest for commercial power service. For 250 kwh. of residential service, the typical net monthly electricity bill in various Alaska communities would be as follows: Ketchikan, $7, Petersburg $8.25, Juneau $8.57, Wrangell $11.05, Kodiak $12.25, Skagway $13, Anchorage $14.33, Cordova $15, Seward $16.50 and $17.10, Sitka $17.50, Fairbanks $18, Valdez $22.75, and Nome $37.50.

● APPARENTLY concerned over prospects that "surplus" Columbia River water might be piped to California, the Puget Sound PUD association of Seattle, Wash., has announced it will oppose any attempt to divide water or power resources of the river by interstate compacts. "Public-preference" rights now enjoyed by PUDs and municipalities should be preserved in any event, the PUD association resolution asserts.



HUNGRY HORSE DAM UNDER CONSTRUCTION

Penstock pipes and river outlet tubes rise above the huge concrete blocks of Hungry Horse Dam, under construction by USBR in Montana. Each of the 13½-ft. diameter penstocks will carry 80 tons of water per second from the 34-mile long reservoir behind the dam. The power plant will contain four 105,000-hp. turbines. The three 8-ft. river outlet tubes, two of which are shown in foreground, will permit use of the dam for flood control

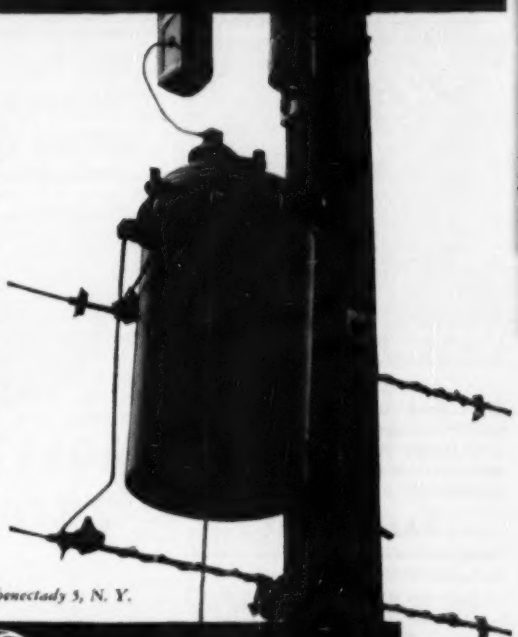
OWENS GORGE POWER PLANT NO. 3 STARTED

Site of the Los Angeles Department of Water & Power's Owens Gorge project plant No. 3. Each plant will have a capacity of 37,500 kva. Power plants are being built by the city and penstock installation will be made by S. H. Koller, Crockett, Calif. Rig in foreground will be used to install penstock on incline. The photo, taken last month, shows Bircham Camp for city employees. The development is scheduled for completion in May, 1951

ROUGHLY HALF OF ALL DISTRIBUTION TRANSFORMER FAILURES CAN BE CHARGED TO LIGHTNING. That's typical experience. However, in Spirakore® transformers delivered since late 1943, lightning failures have been almost insignificant!

There's a reason for this. Back in 1943 G-E research facilities enabled our engineers to make important discoveries about impulse strength. As a result, design improvements were made in small, low- and medium-voltage distribution transformers. The new G-E transformers—built to live with lightning—are improving operating records all over the country.

In all respects Spirakore leads the field. It's the finest distribution transformer we have ever made—the finest you can buy.



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can help you select and maintain this equipment most efficiently

- This new book provides the information which years of experience have shown to be most useful to the man responsible for the installation and maintenance of modern d-c motors, generators, AND ELECTRONIC CONTROL EQUIPMENT.
- It explains in clear practical terms how each part and circuit works; what type of motor is most efficient and economical under certain operating conditions; the latest methods of installing and servicing each part; how to reconnect motors; how to test for power and losses.
- It contains FULL INFORMATION ON BRUSHES—how to select replacements; how to be sure of proper installation.
- ALL THE LATEST CONTROL EQUIPMENT is fully explained, with complete instruction in the operation and maintenance of the Rototrol, Amplidyne, Maxspeed, Mor-O-Trol, Thy-Mo-Trol systems; rectifier tubes, etc.
- More than 7 pages of MAINTENANCE CHARTS give the symptoms and causes of every conceivable motor trouble or possible failure in any part of the control circuits. Clear wiring diagrams are given for every circuit.

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Please send me a copy of DIRECT CURRENT MOTOR MANUAL @ $3.50. I will either remit in full or return the book within 10 days without further obligation.

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LIGHTING CLINIC DRAWS CROWDS IN DENVER

The General Electric's lighting clinic was conducted in Denver, Colo., July 18-20, arousing great interest on the part of illuminating engineers and public alike. Denver's public school system was represented by officials eager to absorb the newest wrinkles to further improve the schoolroom lighting program now in progress.

Practically all branches of the electrical fraternity, operators of industrial establishments and their engineering staffs, appliance dealers, real estate management and a liberal sprinkling of housewives interested in home lighting, participated in the three-day discussions and exhibit clinics at East Denver high school auditorium.

Public Service Co. of Colorado sponsored the event, which came to Denver from Pocatello, Idaho, providing the promotional fanfare that engaged the unusual amount of public and professional interest displayed.

Airplane Hits Bonneville 115-kv. Line Near Portland

Services of 17 Bonneville Power Administration technicians were required to remove an airplane which dangled from a 115-kv. cable 240 ft. above the Willamette River at Portland, after a mid-July crash that threw the pilot and motor of the plane into the river.

A Luscombe monoplane piloted by Ira E. Cook of Portland cracked into one of three Bonneville power cables that span the river near the confluence of the Willamette and Columbia, flipped over and caught its tail on another of the cables, 23 ft. distant.

The accident occurred on a Sunday afternoon, while most of the Bonneville staff was off duty. Workers, summoned from various points along the Bonneville system, assembled equipment within three hours and completed the difficult task at 11 p.m., eight hours later.

● A $2,000,844 CONTRACT for improving the Diablo hydroelectric dam on the Skagit River has been awarded by the Seattle Municipal Board of Public Works to the Morrison-Knudsen Co. Inc., of Boise, Idaho. Spillways of the 20-year-old dam will be extended and the foundations grouted.

● SALT LAKE COUNTY of Utah may soon have county inspection. Meetings on the subject have recently been held, and testimony heard from various people in the industry to point up its desirability.

Pennsylvania

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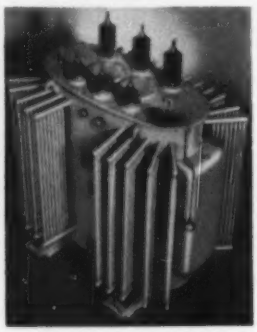
Custom built transformers at Quantity Production Prices

Streamlined methods of manufacturing, plus standard designs and standard parts, shorten engineering and production time to reduce prices and speed deliveries.



Single and three phase sizes up to 10,000 KVA, 69 Kv.

Transformers can be supplied with any method of oil preservation.

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NEWS ABOUT PEOPLE

Sutherland

● NORMAN R. SUTHERLAND, former vice-president and assistant general manager of Pacific Gas and Electric Co., became its vice-president and general manager on Aug. 1, succeeding W. G. EULER, who was made executive vice-president of the company. Euler will assist the president in the general supervision of the affairs and will direct the purchasing department and department of general construction.

● JOSEPH H. COX, a pioneer in the field of lightning research and mercury arc rectifier engineering, has been named supervisor of electrical engineering for the Sunnyvale Works of Westinghouse Electric Corp. Along with his new duties, Cox will retain district-wide supervision of quality control in the company's Western plants.

● ALBERT KAYE has become head distribution engineer for the Western division of Puget Sound Power & Light Co. at Bremerton, Wash., succeeding the late Floyd Lesa, who died recently. HERBERT L. IRVIN, junior distribution engineer, moves up to Kaye's former position of distribution engineer, while BOYD WINTER becomes junior distribution engineer.

● THORNTON EASLER, superintendent of San Francisco's electric power system, retired recently after 33 years of service. B. W. GRETHEL, an engineer with the city since 1936, succeeds Easler temporarily until a Civil Service examination is held to permanently fill the vacancy.

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Babcock

● A. V. K. Babcock has been appointed manager of Central Arizona Light & Power Co.'s newly created industrial development department. His main responsibilities will be to attract to Arizona new industries suitable to the economy of the area; to aid existing industries expand their marketing and production facilities; to create new industries within the state; and to work with groups throughout the state who are endeavoring to reach that objective. Babcock first became associated with Calapco more than 20 years ago. Since January 1949 he has held the position of director of budget control.

● Ross Henninger, former associate editor of Electrical West, will join the Iowa State College Engineering Extension Service staff on Sept. 1. A graduate of the University of Southern California, he worked for Southern California Edison Co. for a time before joining Electrical West. In 1933, he became an associate editor for the AIEE and recently has been director of publications for IES.

● Westinghouse Electric Supply Co. has transferred Dane O. Egbert from the Sacramento branch to the San Francisco district office as industrial sales representative. Egbert succeeds Howard G. Brown, who retired recently. He has been assigned the larger industrial accounts in San Francisco as well as some of the larger international contractors in the area.

● Gerald E. Green of General Electric's San Jose motor plant has been named motor specialist to the company's apparatus department in San Francisco. For the past two years Green has been in charge of sales of polyphase motors at the San Jose plant where they are manufactured.

● J. M. Gaylord has retired as chief electrical engineer of the Metropolitan Water District of Southern California, and Robert M. Peabody has been named his successor. The newly created office of assistant general manager and chief engineer has been filled by Robert B. Diemer, who was formerly chief operation and maintenance engineer of the Colorado River aqueduct system.

Gates

● Lloyd Gates has been appointed to a newly created position in the Los Angeles Department of Water & Power, that of electric service requirements coordinator. To him electrical contractors will go for clarification of questions relating to utility rules and policies for either residential or industrial service. This is to save customers from need to contact several departments. Gates also will explain service policies to groups and associations and represent the department on inspection and code matters. He has been an illuminating engineer and field consultant for the department for 13 years and prior to that was with G-E Lamp Department.

● D. W. McLenegan, with General Electric since 1922, has taken over the responsibility for the operation of the G-E graduate school of nuclear engineering at the Hanford Works, Richland, Wash., in addition to his present duties as manager of the technical personnel office. F. Ellis Johnson, who formerly headed the school, has retired.

● Roy V. Sprague, power manager of the Bureau of Reclamation's Region 3, retired recently after 15 years with the bureau. Wade H. Taylor has taken over his duties as acting regional power manager.

● Leonard A. Hobbs, vice-president and sales manager of Smoot-Holman Co., Inglewood, has just returned from New York and western points. While in New York he learned of his election to the board of directors of the Illuminating Engineering Society. Hobbs attended meeting of Fleur-O-Lier, National Electrical Manufacturers Assn., and RLM. On his return trip he spoke at a luncheon meeting of IES in New Orleans, and was also guest speaker at the Jackson, Miss., chapter of IES.

● Walter T. Lucking has joined the Arizona Edison Co. Inc. as assistant

Lucking

to President Reid Gardner. Lucking was formerly project manager of construction for Ohio Public Service Co. He will headquarter in the Phoenix general office of Arizona Edison and supervise activities of departments handling personnel, budget and rates, new business, safety, advertising and publicity.

● University of California Society of Electrical Engineers, joint branch AIEE-IRE, Berkeley, has elected these officers for the fall semester: John P. Lindley, chairman; Jim Wright, vice-chairman; Elvin Woods, AIEE secretary; Harry Tufts, IRE secretary; Ray Trout, treasurer; Everett Sadler, junior representative to the Engineers Council. R. M. Saunders continues as counselor.

● Samuel L. Friedman has been named director of public relations for the Los Angeles Department of Water & Power, succeeding the late Leo W. Barclay.

"I'm clinching rush panelboard jobs with my own basic supply of *Pushmatic** Electri-Centers!"

1 "I took a tip recently from my local BullDog Distributor and started an emergency Pushmatic stock with several basic Electri-Centers and fronts plus . . .

2 "a few cartons of Pushmatics (they're all the same size, regardless of ratings or types, and fit any Electri-Center, so you don't need too many).

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This timesaving plan is paying off every day for Contractors across the country.

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See your local BullDog Distributor today. He'll be glad to show you how a small emergency supply of flexible Pushmatic Electri-Centers can help you clinch rush panelboard jobs.

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- Simple to install; plenty of wiring room
- Individual single-pole units . . . easier to add or interchange than multiple units
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ONLY TOP FLIGHT MEN WILL BE CONSIDERED.

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Keep these Directories for reference throughout the year.

See Electrical West April 1950 issue for

DIRECTORY OF MANUFACTURERS

68 Post St., San Francisco 4, Calif.

● R. G. Holabird, district manager in San Francisco for National Electric Products Corp., Torrance, Calif., and Pittsburgh, Pa., was the official representative of the City of San Francisco recently when 50 business leaders of San Francisco participated in a good neighbor visit to Eureka, Calif. The San Francisco Chamber of Commerce is sponsoring a series of these trips to neighboring cities. From 25 to 100 business men participate in tours of civic and industrial points of interest within communities scattered around the San Francisco trade area.

● David M. Salsbury has returned to the West Coast to assume the position of vice-president in charge of Texas and Pacific Coast operations for Westinghouse Electric Supply Co., with headquarters in San Francisco. Salsbury has been president of WESCO, New York, since 1948, and asked to be relieved of his position recently to enable him to return to the West Coast for the sake of the health of his family. John F. Myers succeeds him as president.

● Seattle Chapter of the Washington Society of Professional Engineers elected the following officers for the term beginning July 1: Dr. Lloyd N. Robinson, president; Frederick E. Cooper, first vice-president; Beverly A. Travis, second vice-president; Howard E. Johnson, secretary-treasurer; Roy W. Johnson, assistant secretary. Stephen M. Batori was elected trustee of the state society from the Seattle Chapter. As chapter president, Dr. Robinson also will serve as a state trustee.

Deaths

● Carlo P. Christensen, 65, director of the Hoover Dam project of the Bureau of Reclamation, died recently at a Boulder City, Nev., hospital. Mr. Christensen joined the project in 1934 as assistant engineer and later went to Grand Coulee Dam. In 1944 he returned to the Hoover project and had been director since then. Before his work with the Bureau of Reclamation, he had been with Westinghouse, East Pittsburgh, Pa.; with Southern California Edison Co., Los Angeles, and also served as test engineer for the Metropolitan Water District in Los Angeles.

● Herbert M. Edmonds, 61, division manager of California Oregon Power Co., Dunsmuir, Calif., since 1921, died recently. He started with the power company in Yreka and was with the firm in Roseburg, Ore., and Kalispell, Mont.

NOTES ON THE TRADE

● L. E. STARKWEATHER, vice-president and general manager of Leo J. Meyberg Co., Los Angeles, announces the following new assignments of personnel: PAUL BUEHLER, associated with the Meyberg organization for more than 16 years, has been appointed assistant general manager and will be directly in charge of merchandising all white goods lines; HARRIS NEWMARK, formerly manager of the small appliance division, has become vice-president of the company, and division manager for the electronics, small appliance and RCA Victor record divisions. In the Norge division, JOHN CHADWELL, formerly San Diego representative for Norge activities, has been appointed field supervisor for the Norge division. ART HAST, territory representative of the Bendix division for the past four years, has been elevated to the position of assistant manager of the Bendix division. BUD NERNESS, formerly in the RCA Victor record division, has been appointed assistant to L. E. Starkweather.

● BEAMER AND HARRINGTON, consulting engineers, is a new firm just opened at 903 Bank of Commerce Bldg., Oakland. Scott Beamer is the electrical engineer, and Harrington mechanical engineer of the firm. Beamer has been on the staff of Clyde Bentley, and prior to the war was electrical engineer for the Farm Security Administration.

● D. W. ONAN & SONS Inc., manufacturers of electric generating plants, announces the appointment of Nelson Equipment Co., Portland, as Onan distributors in the state of Oregon and several counties of Idaho.

John P. Logan has become industrial sales supervisor for Westinghouse Electric Corp. in Los Angeles area, succeeding C. D. Smith, who becomes assistant to the branch manager of the corporation.

● AMERICAN COACH & BODY CO., Cleveland, Ohio, has announced the promotion of T. A. PELSUE as sales manager of the Western division, with headquarters in Denver.

● WESTERN INSULATED WIRE CO., Los Angeles, is erecting a 40,000-sq. ft. unit of its new plant for the manufacture of "Bronco" insulated electric cords and cables.

Insulated Conduit-
Bushings
Remember when Insulated Bushings were a luxury because they cost so much. That was before UNION entered the field.
Using knowledge gained during the War, on November 1, 1947 UNION introduced the first molded Insulated Bushings. These molded bushings offered economies hitherto unknown.
UNION'S Bushings have a smooth insulated lip that makes wire pulling easy. They will not damage the softest wire insulation. No sharp metallic edges can cut into the wire causing hard-to-locate "grounds".
There is so little difference in the over-all cost of wiring between UNION'S Insulated Bushings and metallic bushings that you cannot afford to risk future trouble from costly "grounds and shorts". It is wise to specify UNION Insulated Bushings throughout as so many are now doing. UNION makes the best.
In sizes 1¼" and up where strength counts, be sure you "see the canvas". Then you know that no substitution of a weaker material can be made.
UNION INSULATING CO.
PARKERSBURG, WEST VIRGINIA

Chalfant

● THOR has announced some changes in its Western organization. M. R. Wilson, general sales manager, has appointed PAUL CHALFANT as branch manager for Thor Corp. in Los Angeles, relieving JOHN E. GUNDERSON of that responsibility in addition to being Pacific Coast branch manager so that he can have more time to contact various branches in the West. EMMETT LENIHAN is the new assistant branch manager in Los Angeles under Chalfant. JOHN SOUTHMAYD is being transferred from the mountain territory at Salt Lake City where he handled distributor accounts to become assistant branch manager to Barney Clawson, San Francisco. Southmayd will continue to cover the mountain distributors as well as the new Fresno and Reno distributors, Kierulff & Co. and Bender Associates.

● JOHN EICHORN has returned West to represent Russell & Stoll Co. and O. Z. Electrical Mfg. Co. in northern California and western Nevada and Liquid Stainless Steel, an anti-corrosive agent, for the Pacific Coast. Eichorn, a graduate of University of California, was with General Electric Co. and G-E Supply until he went East to represent ELECTRACAL WEST in New York. He has an office at 426 Bryant and warehouse at 500 Minnesota St., San Francisco.

● L. M. STAUFFER, manager of General Electric's Salt Lake City office, has announced that the construction of new and expanded repair, maintenance and warehousing facilities for improving service to users of G-E apparatus in the Rocky Mountain area has been completed in Salt Lake City. These facilities, located at 301 S. 7th West St., will be used to service equipment for mines, smelters, power companies and industrial concerns in Utah, Idaho, Montana and Nevada. J. A. McDonald, superintendent of the service shop, and J. C. Davis, warehouse supervisor, will continue in their positions in the new building. The structure more than doubles the company's former capacity for service and repair.

● THE TAGLIABUE INSTRUMENTS Division of WESTON ELECTRICAL INSTRUMENT Corp. has appointed the following Weston district sales representatives who are now in addition handling the Tag line: E. F. Schimbor, Herman E. Held, San Francisco; Edward S. Sievers, Los Angeles; Eicher & Co., Seattle. In the Colorado territory, the Peterson Co. of Denver handles sales of chemical and industrial thermometers, hydrometers and moisture meters. Burson Sales Inc., also of Denver, handles Celectray pyrometers and the mechanical line of Tag temperature and pressure indicating, recording and controlling instruments and dial indicating thermometers.

● CONSTRUCTION is scheduled to start immediately on a new General Electric Co. warehouse in Los Angeles, according to E. M. Ellis, manager of the firm's apparatus department in the area. The one-story building will be built by Central Manufacturing District for lease to G-E. Formal opening is expected early in September. On completion of the new facility, G-E's present Los Angeles warehouse will be occupied by General Electric Supply Corp.

● CHULA VISTA ELECTRIC Co., suburban San Diego electrical contractors, has added an electrical appliance division with its move into a new $25,000 building. The partnership is operated by ALBERT GAUSS and J. M. BURKHART. The building provides 4,000 sq. ft. of show room space and 3,000 sq. ft. of outside working area.

● PYLE-NATIONAL Co. has appointed three manufacturer's representatives in the Pacific Coast territory. They are HENGER-SELTZER Co. of Los Angeles; HODGES and GLOMB of San Francisco; and SHAFFER and NELSON of Seattle, Spokane, Portland and Billings. Direct factory representation will be located in San Francisco.

● BLACKSTONE CORP., manufacturers of household washers, ironers and dryers, has appointed Montana Gas Appliance Co., Billings, to distribute its products. It will replace the C. W. Hendricks Co. The new distributor will cover counties in Montana and Wyoming.

● THE SAN FRANCISCO branch of W. W. Grainger Inc., distributors of motors and electrical supplies, has moved to a new building at 519 Potrero Ave. The new location will provide a 50% increase in space over the company's former plant at 156 8th St. Another 1,000 square feet at the new building is allocated for parking facilities.

● D. W. CUMMING has opened an electrical contracting and sales business at Solsqua, B. C.

Moorhead

● DWIGHT E. MOORHEAD is the new manager of the San Jose motor divisions of General Electric's small and medium motor divisions. In his new job he will be responsible for the operation and management of personnel and facilities in engineering, manufacturing, sales and accounting at the San Jose plant. CARL J. ANDERSON will continue as manager of the factory's manufacturing division, and L. A. MARCH will be manager of the engineering division.

● COLORAMA TELEVISION has established a factory distribution branch in Hollywood, Calif., the company's fifth in five major cities. Other branches are located in Detroit, Chicago, Oakland and New York.

● MULHAUSEN-HANNEGAN Co., Los Angeles, distributors of Bendix radio and television equipment and Orlev refrigerators, has moved to new quarters on Third Ave.

● A & A SUPPLY Co. of Abilene, Tex., has exclusive electrical representation of the F. D. Kees Mfg. Co. in the states of Texas, exclusive of the panhandle district, New Mexico and Arizona.

Now—
Get load ratio control —still save with RM* Transformers

Automatic load-ratio-control equipment, for changing taps under load, is now optional on General Electric three-phase oil-immersed RM-listed Power Transformers:

20% range—10% plus to 10% minus
32 5/8-per-cent steps
Available in 1391 different ratings—
All kva's from 750 to 10,000, three-phase
All EEI-NEMA preferred voltage ratings between:
6900 and 67,000 high-voltage
2400 and 14,400 low-voltage

***RM means "Repetitive Manufacture"—a type designation covering G-E power transformers with standardized construction up to 10,000 kva and 69 kv. This effective standardization—sensibly flexible with optional features—spells lower costs for you. RM prices are eight per cent lower. RM shipments with load-ratio-control average 15 weeks.**

For information on RM transformers with load-ratio-control feature, ask your nearest G-E Apparatus Sales Office. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

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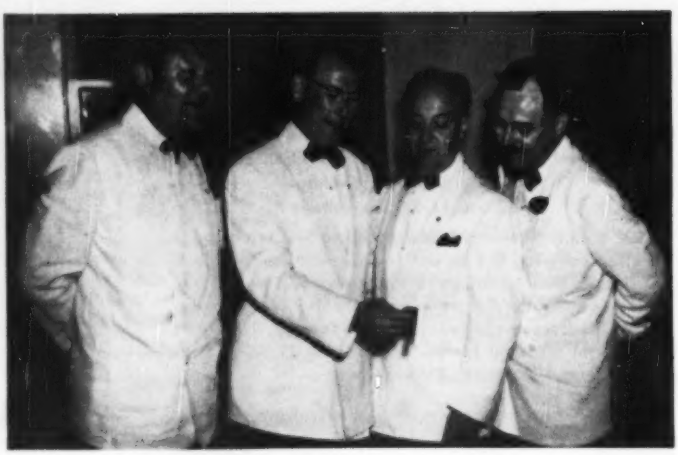
PROFILES

Glenn Ellenberger, a Denver electrical contractor, receives diploma from Coordinator of Industrial Education Schiemann, following completion of the blue print reading course

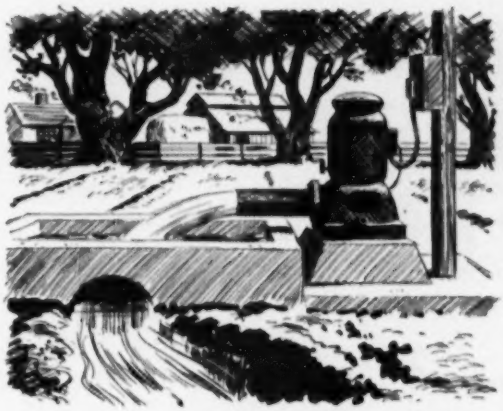
Prize paper award for District 8, AIEE, is received (below) by C. M. Short, Los Angeles Department of Water & Power, and W. G. Hart, General Electric. T. M. Blakeslee, Department of Water & Power, announced the award, presented the winners a $75 prize at the AIEE summer meeting in Pasadena



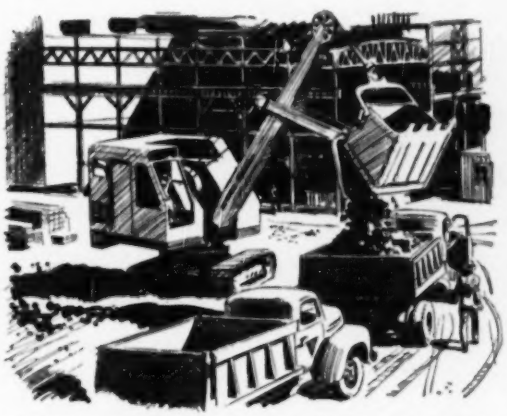
RETIRING PRESIDENT of Associated Pot and Kettle Clubs, Fred C. Wood, second from left, looks at the new watch given him by members for his successful year, as new president Clark Wright, housewares manager of Meier and Frank Co., Portland, sees that it's time to take over. At left, James Stewart, Portland, new treasurer; extreme right, Kenneth Dahm, Denver, new vice-president. Secretary is Curt Bosto. Officers were elected at the 19th annual convention of the Associated Pot and Kettle Clubs of America recently at Feather River Inn

How low-cost power helps stimulate business in your community

1. Retail appliance sales are greater in this area than in any other part of the country, and one sales incentive is the low cost of gas and electricity. Still more business is being encouraged in your community by P. G. and E.'s advertising program backing appliance dealers.



2. Farm profits stay high because of modern methods and new electrically operated equipment which boost production. For example, an electrically irrigated acre of land in Northern or Central California yields crops worth $240 a year . . . while an unirrigated acre brings only $12.



3. New manufacturers are building here, spending $100 million last year in new construction, because of the area's many natural attractions . . . plentiful power, a rich market, skilled labor, fine climate. This industrial expansion brings more wealth and business activity to Northern California.

4. Local merchants and service people benefit from P.G. and E.'s huge payroll. Last year more than 16,500 P. G. and E. employees put their $69-million payroll to work in their own Northern California hometowns—for food, rent, clothes, amusements, investments, hardware, newspapers, automobiles.

Your gas and electric rates are among the lowest in the nation

P·G·and E·

8X-50

PACIFIC GAS AND ELECTRIC COMPANY

Birth of a Salesman

Appliance sales often are made—or lost—long before Mr. and Mrs. Prospect read that enticing ad or listen to the honeyed appeals of the crack salesman. The *first step* in the sale depends on the quality of the wiring job—sealed within the walls of the prospect's home.

An appliance salesman is "born" when Certified Adequate Wiring is specified by architect or builder in home plans. Today's electric living —with its heavier load of work-saving appliances—demands heavier wire, more circuits, outlets, switches and a larger service entrance.

Without these essentials there can be no prospect . . . no sale . . . and hence, no salesman.

PACIFIC COAST ELECTRICAL ASSOCIATION

601 WEST FIFTH STREET, LOS ANGELES 13 — 447 SUTTER STREET, SAN FRANCISCO 8